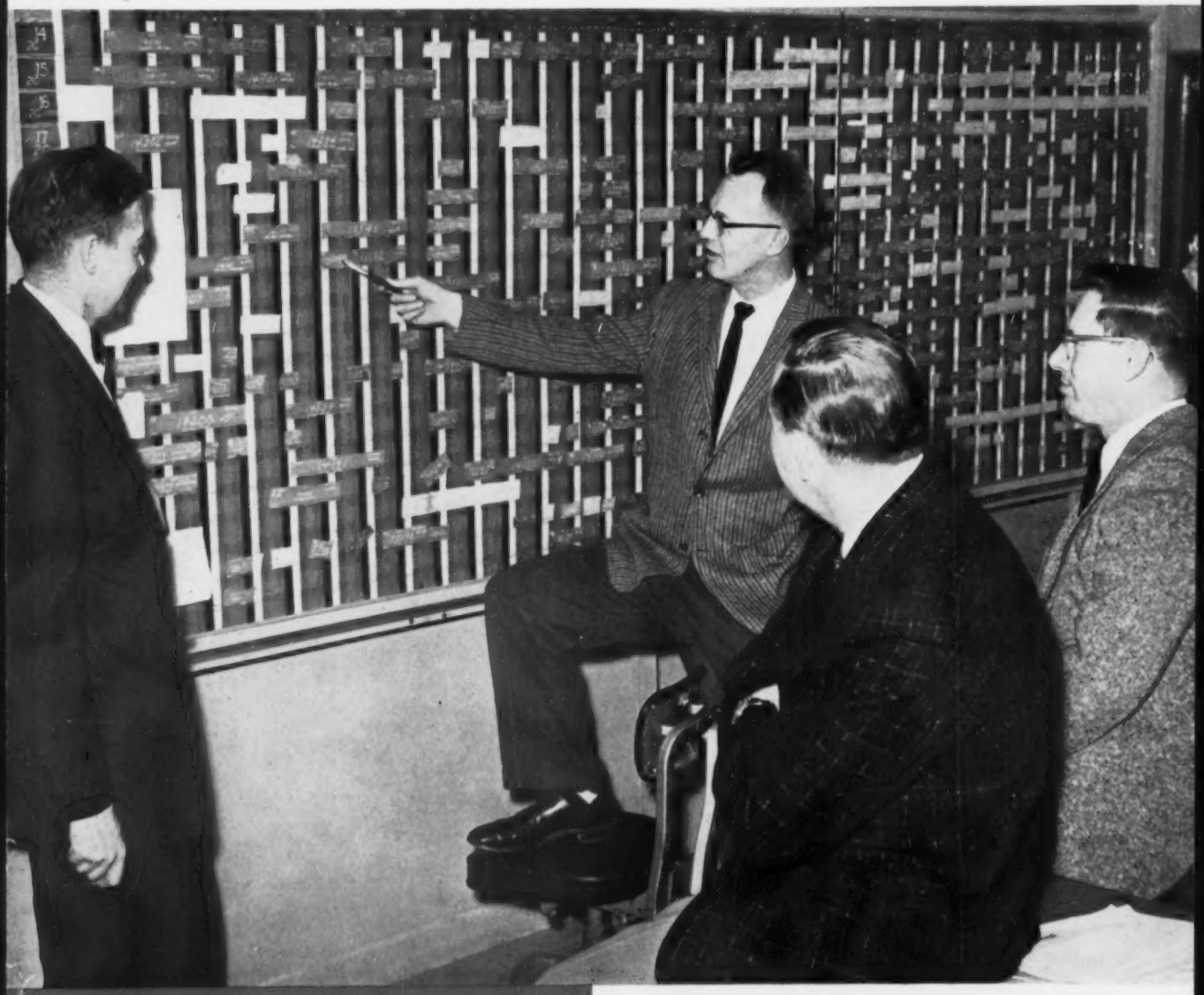
The IRON AGE
January 16, 1958 A Chilton Publication The National Metalworking Weekly



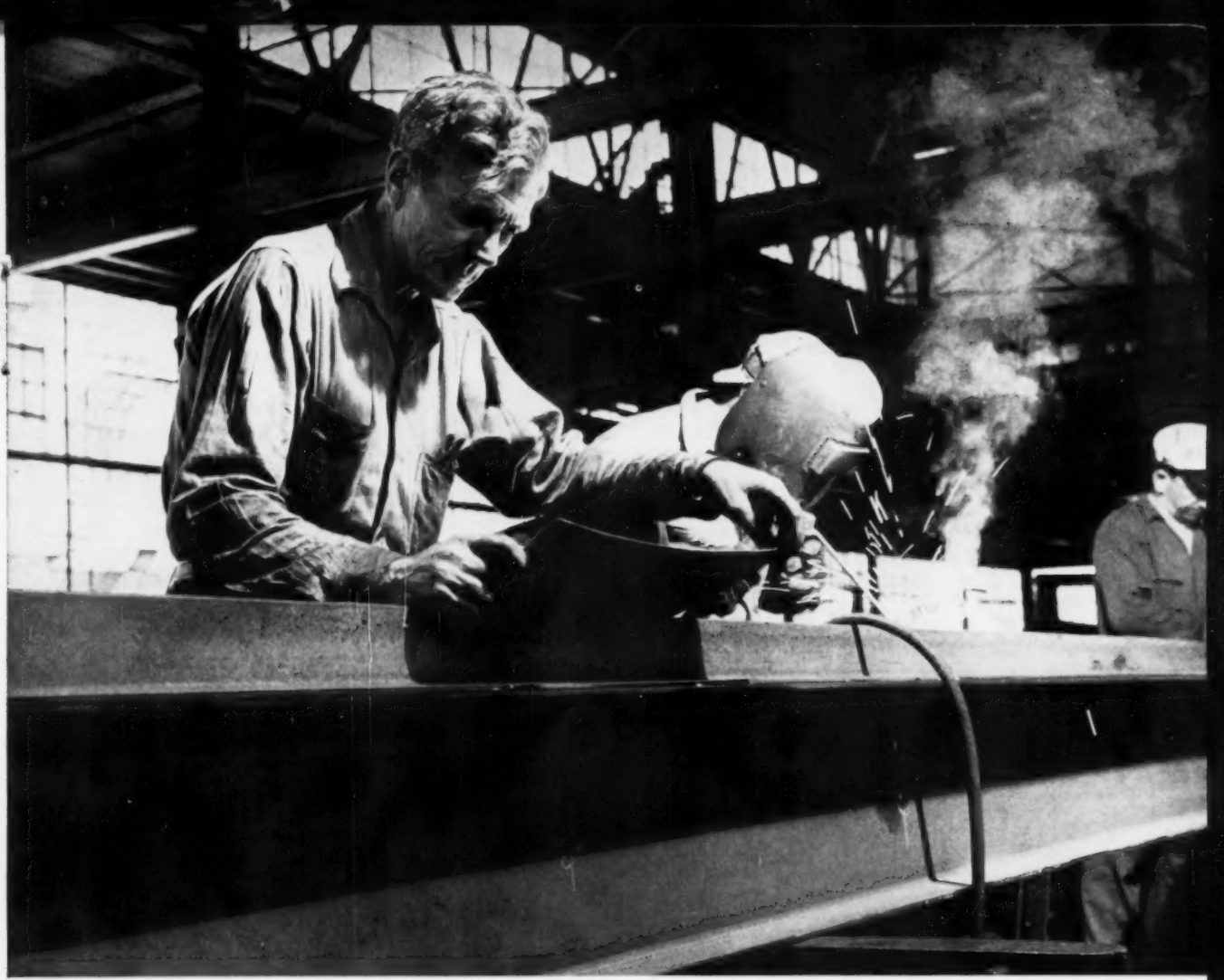
Can You Profit From Operations Research? P. 71

The Hecklers

WHY NOT DESCRIBE YOUR OPEN-HEARTH CARTOON IDEA AND SEND IT ALONG TO US?

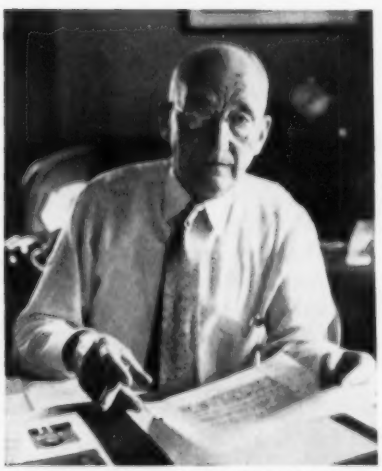
The benefits steelmakers obtain from our refractories are in part a result of Basic's on-the-job servicing. One of the rewards of this close relationship has been the opportunity to observe and appreciate the lighter side of these usually serious craftsmen.

BASIC INCORPORATED 845 HANNA BUILDING • CLEVELAND 15, OHIO



Distributors of Bethlehem shapes maintain large stocks, and many have some fabricating facilities.

Emergency Call ...and the distributor was ready!



William F. Lotz, president of William F. Lotz, Inc.

Like most contractors, William F. Lotz, Inc., Philadelphia, Pa., gets many emergency requests. But a recent call from a nearby factory had even more drama than usual.

The factory floors, supported on wooden beams, were sagging under the weight of tremendously heavy machines. A dangerous condition—and to make matters worse, the floor sag was throwing the machines out of alignment, causing production problems.

Lotz was asked to come in over a weekend and shore up the floors at the touchiest points. To do it, he needed structural steel—in a hurry! After a quick inspection of the situation, he called a distributor who stocked the necessary shapes.

The distributor worked around the clock for forty-eight hours preparing the steel; it was delivered to Lotz on time. The job in the factory was finished on time.

"We needed that distributor's help," says William F. Lotz, "and we got it. He didn't ask questions. He just went to work!"

HERE'S WHAT THE DISTRIBUTOR OFFERS YOU. Bethlehem shapes, plates, bars, sheets, tool steel, and other steel products are available through distributors from coast to coast. Your order can usually be started on the way in a matter of hours. But steel isn't the only thing the distributor offers. He is equipped to do things—to perform services like shearing, flame-cutting, slitting, sawing. Get to know the local distributor of Bethlehem products. He can be mighty helpful.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.
Bethlehem Pacific Coast Steel Corporation, San Francisco

BETHLEHEM STEEL

Call the distributor—your Shopping Center for Steel

THE IRON AGE
Chestnut and 56th Sts.
Philadelphia 39, Pa.
SHerwood 8-2000

GEORGE T. HOOK, Publisher

EDITORIAL STAFF

TOM C. CAMPBELL, Editor-in-Chief
GEORGE F. SULLIVAN, Editor

Managing Editor — E. G. Beaudet
News-Markets Editor — J. B. Delaney
Asst. News Mkts. Ed. — R. D. Raddant
Technical Editor — J. J. Obrzut
Machinery Editor — E. J. Egan, Jr.
Metallurgical Editor — P. M. Unterweiser
Materials Editor — Wm. Czygan
Engineering Editor — R. H. Eshelman
Art Director — J. A. Degen

Associate Editors: F. J. Starin, P. J. Cathey, R. Schulin, F. T. P. Plimpton, Jr.
Assistant Editor: J. A. Moore. Regional Editors: K. W. Bennett, Chicago; T. M. Rohan, Cleveland; H. R. Neal, Detroit; G. G. Carr, New York; R. R. Kay, Los Angeles; G. J. McManus, Pittsburgh; G. H. Baker, R. M. Stroupe, N. R. Regeimbal, Washington. Correspondents: F. L. Allen, Birmingham; N. Levenson, Boston; R. M. Edmonds, St. Louis; J. Miller, San Francisco; R. Kazarian Buffalo; D. A. Coughlin, Seattle; F. Sanderson, Toronto; F. H. Harley, London, England; Chilton Editorial Board: Paul Wooton, Washington representative.

WASHINGTON EDITORIAL OFFICE

Washington 4 ..... National Press Bldg.

BUSINESS STAFF

Production Manager — Warren Owens
Director of Research — Oliver Johnson
Circulation Mgr. — W. M. Coffey
Promotion Manager — Richard Gibson
Asst. Research Dir. — Wm. Laimbeer

REGIONAL BUSINESS MANAGERS

Chicago 1 ..T. H. Barry, W. R. Pankow
360 N. Michigan Ave. — Randolph 6-2166
Cleveland 15 ..... Robert W. Watts
930 B. F. Keith Bldg. — Superior 1-2860
Columbus 15, Ohio ... Harry G. Mumm
LeVeque-Lincoln Tower — Capital 1-3764
Detroit 2 ..... W. J. Mulder
103 Pallister Ave. — Trinity 1-3120
Los Angeles 28 ..... R. Raymond Kay
2420 Cheremoya Ave. — Holly'd 3-1882
New York 17 ..... C. T. Post, I. E. Hand
100 E. 42nd St. — Oxford 7-3400
Philadelphia, B. L. Herman, J. A. Crites
56th & Chestnut Sts. — Sherwood 8-2000
Pittsburgh 22 ..... T. M. Fallon
1502 Park Bldg. — Atlantic 1-1830
San Francisco 3 ..... Don May
1355 Market St. — UNderhill 1-9737
Tulsa ..... H. E. Mott, J. W. Sangston
621 Petroleum Bldg. — Luther 4-1769
W. Hartford 7 ..... Paul Bachman
62 LaSalle Rd. — Adams 2-0486
England ..... Harry Becker
15 Gratton St., Altrincham, Cheshire

One of the Publications Owned and Published by Chilton Company, Chestnut & 56th Sts., Philadelphia 39, Pa.

OFFICERS AND DIRECTORS

Joseph S. Hildreth, Ch. of the Board
G. C. Buzby, President

Vice-Presidents: P. M. Fahrendorf, Harry V. Duffy, George T. Hook, Robert E. McKenna, Leonard V. Rowlands; Treasurer, William H. Vallar; Secretary, John Blair Moffet; Directors: Maurice E. Cox, Frank P. Tighe, Everit B. Terhune, Jr., Russell W. Case, Jr., John C. Hildreth, Jr.—Comptroller, Stanley Appleby.

Indexed in the Industrial Arts Index and the Engineering Index.

BPA NBP

THE IRON AGE, published every Thursday by CHILTON COMPANY, Chestnut & 56th Sts., Philadelphia 39, Pa. Entered as second class matter, Nov. 8, 1932, at the Post Office at Philadelphia under the Act of March 3, 1879. Price to the metal-working industries only or to people actively engaged therein, $5 for 1 year, $8 for 2 years in the United States, its territories and Canada. All others $15 for 1 year; other Western Hemisphere countries, $25; other Foreign Countries, $35 per year. Single Copies 50¢. Annual Review Issue $2.00. Cable: "Ironage," N. Y.

The IRON AGE

January 16, 1958—Vol. 181, No. 3

Digest of the Week in

★Starred items are digested at right.

NEWS ARTICLES

ASSEMBLY PLANTS

Close to Markets—When Chrysler had to replace its old Evansville assembly plant, it was forced to

move closer to its growing markets. Competition dictates proximity of assembly to dealers. P. 37

STRIP-FROM-POWDER

Behind the Scenes Action—The seeming quiet in this new field is misleading. One company plans to invest $50 million in five plants for rolling copper strip from powder. Other producers are watching. P. 42

WATER

Problem for Industry — Battelle report says water supplies must be evaluated as a local problem. New industries may be able to cut water use by recirculation or other methods. P. 46

FEDERAL SPENDING

Pump Priming Started—The Administration is pushing Federal projects at full speed. Hope is to

Metalworking

SCIENTIFIC METHOD: Apply it to management problems and it's called operations research. Here plant management at Argus Cameras Div., Sylvania Electric Products, Inc., finds benefits in planning from OR model. P. 71

stimulate business and get an upturn under way before elections next November. P. 59

SHIPYARDS BUSIER

New Contracts in Farwest—Private and Naval shipbuilders on the West Coast are garnering $103 million worth of new business. Yards in both Washington and California will share in the work bonanza. P. 61

FEATURE ARTICLES

COLD RETORT FURNACE

For Brazing Honeycomb—Vacuum furnaces are fast becoming the standard means of brazing stainless steel honeycomb panels. But as brazing temperatures go higher, problems in retort life mount in proportion. It's brought on the development of water-cooled retorts for more efficient operation. P. 74

NEW TITANIUM ALLOY

Strong at High Heat—A new titanium alloy shows up well in tests to check its high - temperature strength and stability. The key is in the heat treatment of the material. It's the result of a search for an alloy that would be stable under high-temperature creep conditions and tensile elongation. P. 76

POWER BRUSHES

Take on Maintenance—Such materials as sand, coke, and ores, tend to stick to conveyor belts. To control this problem, a new brush, designed to flex and clean itself, eliminates carry-over and reduces maintenance clean-ups. P. 80

VERTICAL TRANSFER

For Large Units—A new vertical-lift conveyor lifts 1600-lb auto bodies in automatic cycle. It's a transfer unit that gets maximum transfer speed with three indexing stations. P. 82

IRON SHOT METALLURGY

Why It's Important—The quality of malleable iron shot depends on a number of metallurgical variables. Quench cracks and gas holes are common defects of improperly prepared shot. Application in peening or in cleaning determines what microstructure is best. P. 84

MARKETS & PRICES

EXPORT

Worthwhile Market—A big asset of the foreign market is as a safety valve in domestic slowdowns. An export authority tells how to establish contacts for export markets. P. 40

BERYLLIUM

Air Force Orders Sheets—Beryllium's light weight and strength at high temperatures have long intrigued aircraft makers. Now, Air Force has ordered sheets of it for a two-year study. P. 44

CUTTING TOOL LIFE

Increases With Speed—Beyond a certain point, high speed might help prolong cutting tool life. The theory is backed up by experiments at Lockheed Aircraft Corp. P. 63

STEEL STOCKS

Inventories Are Falling—Inventories of steel users are still going down. It's estimated that six million tons were cut from stocks in the second half of 1957. P. 105

FORGINGS DELIVERY

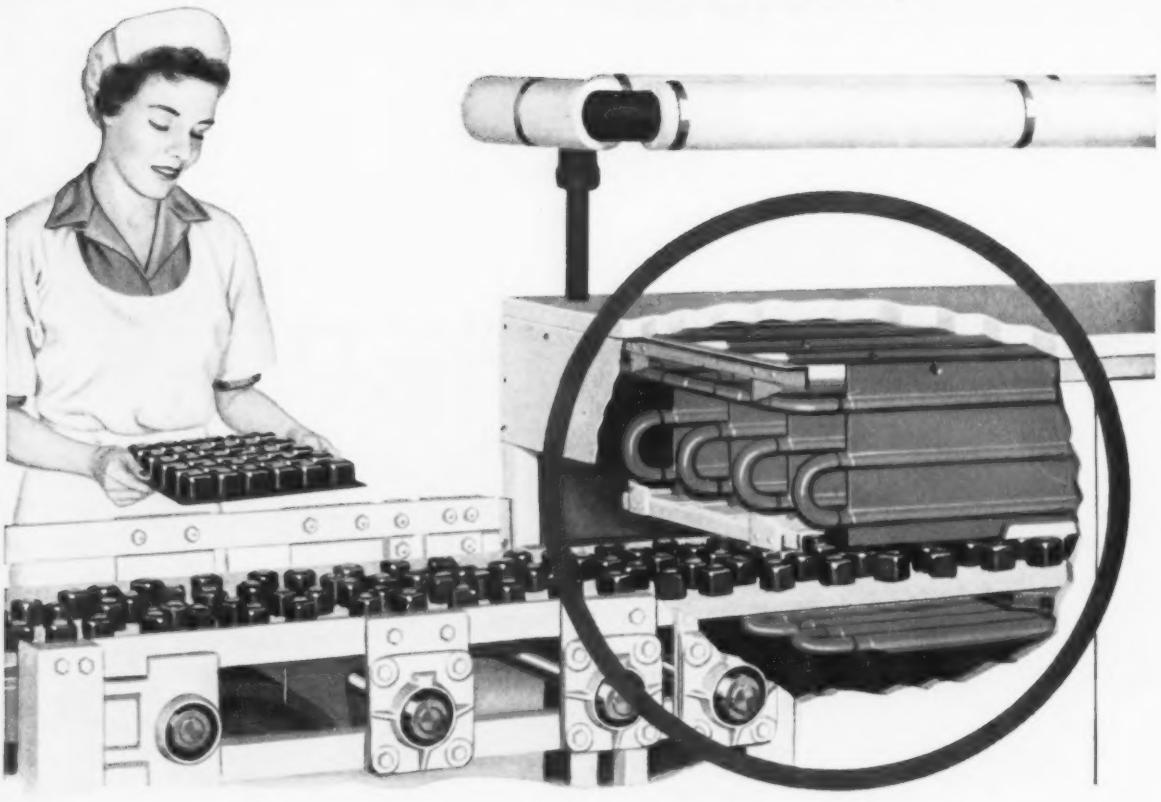
On Rush-Rush Basis—Users are shopping around these days to get fast shipment from forgers. Buyer pressure for lower price on light forgings seems doomed to failure. Some heavier forgings may go up in cost after March. P. 106

NEXT WEEK

'INVENTORYITIS' CURE

For Healthy Stock Levels—All too often, inventories are either too high for profits or too low for comfort. How to level out the peaks and valleys is the subject of next week's feature authored by a prominent steel company executive.

Copper, painted black to increase heat absorption, cuts cooling-time 40%, increases production 66%, in Barricini's Long Island City factory.



Use COPPER

...and cut cooling-time!

One thing a candy manufacturer worries about is the shelf-life of his chocolates. And he knows that the difference between stability and discoloration may be a question of the *rate* at which his product *cools*.

The Barricini candy makers found *radiant* cooling . . . with *Copper* . . . an ideal answer.

Former methods kept candy in the cooling tunnel for 12.2 minutes. Now, cooled with Copper, it goes through in 7.3 minutes.

That's 40% faster . . . and cutting cooling-time increased production 66%. Copper saved floor space, the cost of additional machines, and *time . . . where time is money!*

Copper stands alone in its efficiency wherever heat transference is involved. That's why manufacturers of heating . . . or cooling . . . products prefer Copper! And they find Copper or any of its alloys easy to work . . . easy to machine, form, draw, stamp, plate and join. They can count on an ample supply of Copper, too!

COPPER · BRASS · BRONZE

in over 40 Standard Alloys!

Address your inquiry about cooling and heating and other applications of Copper to the Copper & Brass Research Ass'n., 420 Lexington Ave., New York 17, N.Y.

OSBORN®

BEFORE BRUSHING

AFTER BRUSHING

Centerless Brushing Method

quickly produces precision finish

Osborn Matic® Brush puts final finish on aluminum pistons.

WHEN it comes to precision finishing of cylindrical parts, Osborn's Centerless Brushing method does the job quickly and efficiently.

The aluminum pistons shown above are fed across the face of an Osborn Matic® Bufcut® Brush mounted on a standard centerless grinder. Feather burrs are thoroughly removed, surface junctures blended, and surface finish refined . . . automatically and economically.

A wide range of cylindrical parts can be processed in a similar manner.

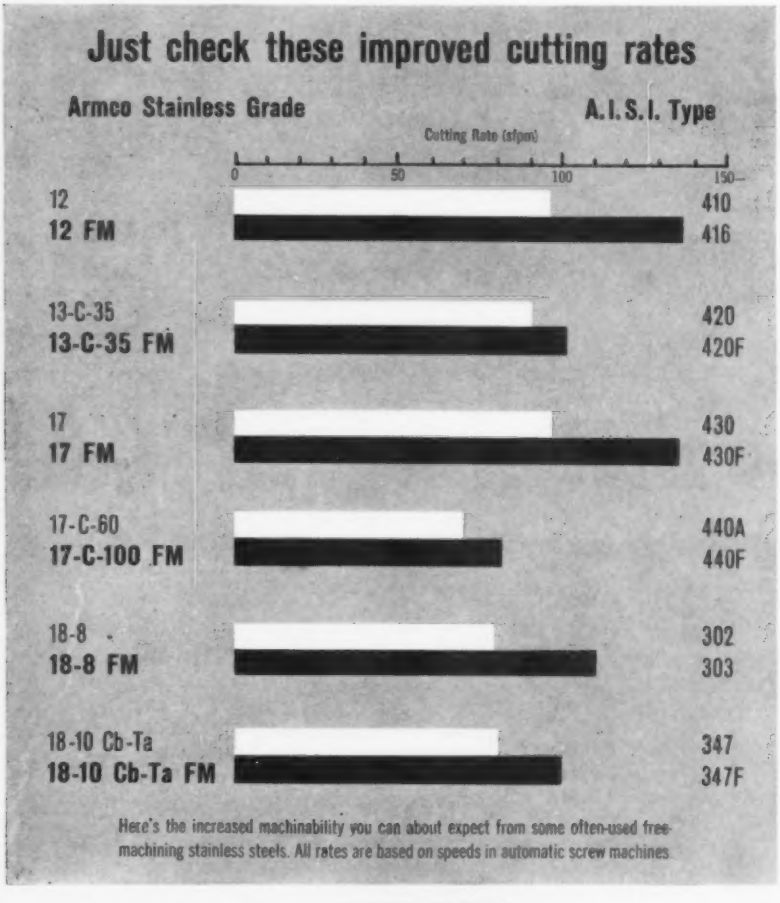
An **O**sborn **B**rushing **A**nalysis, made in your plant at no obligation, will demonstrate how Osborn Power Brushing Methods can help automate your operations...improve your product. *The Osborn Manufacturing Company, Dept. F-65, Cleveland 14, Ohio.*

Write Today for the new 100-page Osborn Catalog 210-C.

Osborn Brushes

BRUSHING MACHINES • BRUSHING METHODS • POWER, PAINT AND MAINTENANCE BRUSHES • FOUNDRY PRODUCTION MACHINERY

Why production steps up with ARMCO FREE-MACHINING Stainless Steels



In service, the toughness of stainless steels gives them endurance that ordinary metals can't match. But in part-production, this very toughness can limit machining speeds. That's why Armco produces free-machining counterparts for many widely-used grades of stainless steel bar and wire. Small additions of certain elements make these special grades machine faster. Production rates jump.

TRY THEM

Here's how to prove it for yourself. If you now machine parts from a standard stainless steel, just contact your nearest Armco Sales Office or Armco Stainless Distributor. They will be glad to arrange for you to try out the Armco Free-Machining counterpart of the grade you are now using.

Or, if you would like more information about uniform-quality Armco Stainless Steel bar and wire, just fill in and mail the coupon.

• • •

In addition to stainless steel sheet, strip, plate, bar and wire, Armco produces these other steels for top-quality products: ALUMINIZED STEEL, ZINCGRIP®, ZINCGRIP PAINTGRIP®, Cold-Rolled PAINTGRIP, Enameling Iron, Electrical Steels, High Strength Steels, Welded Steel Tubing, and Long Ternes, as well as high-quality hot- and cold-rolled sheets.

ARMCO STEEL

ARMCO STEEL CORPORATION
1178 CURTIS STREET, MIDDLETOWN, OHIO

ARMCO STEEL CORPORATION
1178 Curtis Street, Middletown, Ohio

SEND more information about Armco Stainless Steel bar and wire.

☐ I am interested in free-machining grades

Name_____

Title_____

Firm_____

Street_____

City_____ Zone____ State_____

SHEFFIELD DIVISION • ARMCO DRAINAGE & METAL PRODUCTS, INC. • THE ARMCO INTERNATIONAL CORPORATION

Organization Charts: Good, But We Need Men Too!

What with sputniks, defense needs, and a recession, our hard work is cut out for us. The something-for-nothing lads and those who want it too easy are on their way out.

The business outlook is serious: It calls for changes in our thinking. But let's not make wrong changes in the name of right thinking.

This is the time to revise policies. We must choose correctly those who will meet bigger responsibilities coming this year—and in the years after. Necessary action must be taken now.

Often seemingly simple things rock the boat, lead to waste motion, and generally mess up good intentions. Organization charts sometimes do this. They are fine. We need them. But let's not spend so much time deciding whether the line should be dotted or solid that we forget what the charts are for.

Our government has trouble with the "chartists"; it often has the charts but no men to bring them alive. Fortunately, that isn't always true; it is probably the exception. But business with its occasional mirror-on-the-wall-who-is-fairest-of-them-all attitude often is more vulnerable to paper empire accusations than it is willing to admit.

Many of us have the mistaken idea that once a chart is drawn, the lines put in and the duties assigned, the job does itself. It doesn't work that way.

A major job this year is to see that the right man has the right job on the chart. Only by using grey matter, experience, and solid trial and error will we do this.

The coming race between the abundant life and the hard facts of a cold war with its astronomical cost are going to call for super management. Averages won't do; mediocrity isn't wanted. Less-than-fair is sheer lunacy—for the company, for the country, and for the man.

By and large, we have the right man on the job but this is the time to make sure; to go over the whole picture. We must reward the courageous and competent quickly and down-grade the neither-failure-nor-success.

If we do nothing much more this year than to bring our organization chart alive with men who do only the best, that will be fine. The rest will take care of itself.

There isn't much time!

Tom Campbell

Editor-in-Chief

LETTERS FROM READERS

Roll Up Your Sleeves

Sir—Terrific! That's about the best way I can think of to describe your Nov. 28 editorial, "Roll Up Your Sleeves: There's Plenty of Opportunity."

This editorial should be reproduced and made 'must' reading by every business executive in these United States. It is hard-hitting, meaty and inspiring.

Since I have been a reader of The IRON AGE, I have read many fine editorials writtin by you. In my opinion, this is one of the best I have ever read—by you or anyone else—and it couldn't be any timelier.

Congratulations for an excellent job that needed to be done!—F. J. Smith, Vice Pres.-Marketing, Columbus Bolt & Forging Co., Columbus.

Sir—Your editorial "Roll Up Your Sleeves . . .," is so well stated, and so invigorating that we would like to reproduce it, if we may have your permission.

We are sure American industry will react in the hoped for way to meet the situation head on—and thus master the situation.

Congratulations!—P. H. Krupp, Asst. Mgr., Infrared Sales, The Fostoria Pressed Steel Corp., Fostoria, O.

▪ Permission granted.—Ed.

Teacher's Aid

Sir—If available for distribution, may I have reprints of the following articles: "Diversification: Is It Always the Answer," Oct. 3, 1957, and "How to Plan New Products," Oct. 17, 1957.

As a teacher of marketing I am very interested in both topics. I am sure both articles would be helpful to me and of interest to my students.—H. C. Barksdale, Assoc. Prof. of Marketing, New York University, New York.

Hits the Spot

Sir—One of our members has sent us the article on "Government in Business" from your Nov. 28 issue. This hits the spot so well that I'd like very much to have your permission to reproduce it and send it to our some 400 members throughout the United States and Canada.

We have a very active Government Affairs Committee whose principal function during peace time is to watch this government competition with business and this should provide wonderful ammunition for them.—E. F. Way, Secy. and Gen. Mgr., Marking Device Assn., Evanston, Ill.

▪ Permission granted.—Ed.

Cost Cutters

Sir—I would appreciate obtaining six reprints of an article entitled "How to Plan for Lower Costs," pages 97 to 104 inclusive in your Dec. 12 issue.

This is a very practical and timely article, and we wish to pass some copies along to some of our key supervision. — C. W. Morehead, General Works Mgr., Page-Hersey Tubes, Ltd., Welland, Canada.

"This taking of tranquilizers during office hours has got to stop!"

NEW

MALE & FEMALE DIES

FOR METAL STAMPING

THE ACCURATE **A. D. M.®** STEEL RULE MALE and FEMALE DIE

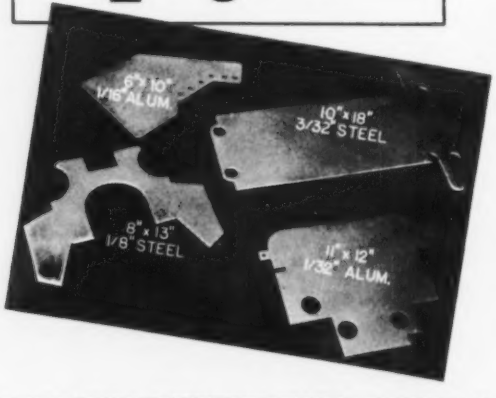
- Steel and Similar Metals up to .140 in Thickness
- Aluminum and Similar Metals up to .202 in Thickness

COST

Only a fraction of the cost of conventional Male & Female Dies. The larger the die the greater the proportionate savings.

Come complete with line-up pins ready to attach to your die set.

DELIVERY FROM 2 TO 5 DAYS



BREAK YOUR DIE BOTTLE NECK
SOLVE YOUR DIE MAKER SHORTAGE

An Accurate ADM "Steel Rule" Male & Female Die Is Your Best Buy

ALL QUOTATIONS ANSWERED THE SAME DAY WE RECEIVE THEM

MINIMUM PRODUCTION ON STEEL AND SIMILAR METALS

THICKNESS	MINIMUM	MAXIMUM
1/32 STEEL	100,000	UNKNOWN
1/16 STEEL	100,000	UNKNOWN
3/32 STEEL	75,000	UNKNOWN
1/8 STEEL	50,000	UNKNOWN

MAXIMUM UNKNOWN AS DIES HAVE NEVER BEEN RUN TO DESTRUCTION

MINIMUM PRODUCTION ON ALUMINUM AND SIMILAR METALS

THICKNESS	MINIMUM	MAXIMUM
1/16 ALUMINUM	125,000	UNKNOWN
3/32 ALUMINUM	100,000	UNKNOWN
1/8 ALUMINUM	75,000	UNKNOWN
5/32 ALUMINUM	50,000	UNKNOWN
3/16 ALUMINUM	40,000	UNKNOWN

MAXIMUM UNKNOWN AS DIES HAVE NEVER BEEN RUN TO DESTRUCTION

The Best Buy is an Accurate Die

ACCURATE©

STEEL RULE DIE MANUFACTURERS

22-24 West 21st Street, New York 10, N. Y. • CH 2-0860-1-2

OVER A QUARTER OF A CENTURY OF DIE MAKING SERVICE TO INDUSTRY

Marketing Guide

If you are in the business of selling to metalworking you won't want to miss one of the hottest research tools ever offered to sales and marketing managers. We refer, of course, to the The IRON AGE's 1958 edition of Basic Marketing Data on Metalworking just off the presses.

Bound in one of the most attractive covers we've seen in a long time, the new BMD book can help you:

1. Pinpoint important metalworking industries and plants.
2. Evaluate markets on a geographic basis.
3. Establish sales territories.
4. Measure sales performance.
5. Determine the market potential for your products.

New Figures—If this doesn't convince you we will go on to say that you won't find the up-to-date data in this volume anywhere else. The data presented are a statistical summary of an original and complete census of the metalworking industry taken by The IRON AGE in 1957. Using the new 1957 S. I. C. codes the 1958 Basic Marketing Data book presents the most recent figures available on plants employing 20 or more plant workers in 2, 3, and 4-digit industry detail.

For sales and marketing men we think this 309-page research tool is one of the best buys in years at $25.00 per copy.

Engineersmanship

Once again we tip our hats to Benson-Lehner Corp. for these items on the new art of Engineersmanship:

DON'T GET CAUGHT

Build, build, build. This is an age of plenty. Never risk being caught with your mock-up down. And remember . . . there is nothing like a mass of hardware to justify an over-run.

NO PREDICTIONS

Never prepare a schedule or predict results. It takes all the fun out of life. Who'd watch a ball game if they knew how it was going to turn out. And besides, engineering is such an unpredictable thing . . . why take the charm out of it. Only people like accountants and such take schedules seriously.

HOLD TIGHT

Uphold your professional standards. It's not enough to be difficult, you must be impossible. This will make sure you are noticed by the front office. Make them realize you are an engineer.

SHORT NOTICE

Never forget the purchasing department. Your reputation there is as important as anywhere else. Make sure that everything you order has no more than 24 hours delivery on it. They know perfectly well that if you can wait for a week the part can't be very important.

"We didn't plan anything for this quarter. We're just going to let things louse themselves up."

Insert halves are first carefully cleaned and fluxed. The sheet of EASY-FLO, .005" thick, in three sections, is liberally fluxed with HANDY FLUX. Following this, the halves are put together with EASY-FLO as a "sandwich filler" (below, left). Entire assembly is heated to a brazing temperature of 1170° F.

How EASY FLO Helps COLUMBIA RECORDS make records

EASY-FLO is put to excellent use in the die inserts (or backing plates) used in the manufacture of Columbia Records at the company's Bridgeport, Connecticut, plant. These die inserts are the heating and cooling elements used in the actual plastic record molding; in a very real sense, they are *behind* the entire record-making operation. The die insert assembly consists of two steel plates, the bottom plate being grooved to permit the passage of steam, at a temperature of 300° F under a pressure of 130 lb., followed by cold water at a pressure of 120 lb. When joined, they must be absolutely leak-tight and strong enough to stand up under thousands and thousands of stampings through drastic temperature changes and thermal shock.

These brazed backing plates have a life cycle of some 250,000 records; they are usually retired because of warpage in the steel, rarely for joint leakage.

This example illustrates just a few of the qualities that make silver brazing such a superior joining method. Strength under high pressure, resistance to temperature changes and thermal shock, and production ease; one, or all, of these qualities may apply to your product or production operation. We will be happy indeed to show you how you can benefit from this blue-ribbon method of joining all kinds, shapes and sizes of metals—similar and dissimilar. BULLETIN No. 20 will get you off to a good start on the values, techniques and economies of low-temperature silver brazing. Write for your copy.

Your NO. 1 Source of Supply and Authority on Silver Brazing Alloys

HANDY & HARMAN

OFFICES and PLANTS
BRIDGEPORT, CONN.
PROVIDENCE, R. I.
CHICAGO, ILL.
CLEVELAND, OHIO
DETROIT, MICH.
LOS ANGELES, CALIF.
TORONTO, CANADA
MONTREAL, CANADA

General Offices: 82 Fulton St., New York 38, N. Y.
DISTRIBUTORS IN PRINCIPAL CITIES

EXHIBITS, MEETINGS

Plant Management and Engineering Show—Jan. 27-30, 1958, International Amphitheatre, Chicago.

Packaging Machinery and Materials Show—March 25-28, Convention Hall, Atlantic City, N. J. (Hanson & Shea, Inc., One Gateway Center, Pittsburgh 22.)

JANUARY

Institute of Scrap Iron & Steel Inc.—Annual meeting, Jan. 19-22, Eden Roc, Fontainbleau, and Deauville Hotels, Miami Beach, Fla. Society headquarters, 1729 "H" St., N. W., Washington 6, D. C.

Compressed Gas Assn., Inc.—Annual meeting, Jan. 20-21, Waldorf-Astoria, New York. Society headquarters, 11 W. 42nd St., New York.

Truck Trailer Manufacturers Assn.—Annual meeting, Jan. 20-22, Palm Beach Biltmore Hotel, Palm Beach, Fla. Society headquarters, 710 Albee Bldg., Washington 5, D. C.

American Road Builders' Assn.—Annual meeting, Jan. 20-23, Sheraton-Park Hotel, Washington. Society headquarters, 600 World Center Bldg., Washington 6, D. C.

American Institute of Electrical Engineers — Winter meeting, Jan. 20-24, Hotel Statler, New York. Society headquarters, 33 West 39th St., New York 18.

Steel Shipping Containers Institute Inc.—Winter meeting, Jan. 21-22, St. Regis Hotel, New York. Society headquarters, 600 Fifth Ave., New York 20.

Cutting Tool Mfrs. Assn.—Annual meeting, Jan. 22, Detroit Yacht Club, Detroit. Society headquarters, 416 Penobscot Bldg., Detroit.

Association of Steel Distributors, (Continued on P. 16)

NEW!...

At W-K-M Division of A-C-F Industries, Inc., Houston, Texas, Gulfcut Heavy Duty Soluble Oil has been used extensively on turret lathes for threading, boring, facing, turning, and grooving operations. This Gulf customer says: "Gulfcut Heavy Duty Soluble Oil gives us long tool life and excellent finishes."

Erich Brenner, Foreman at W-K-M, informs Jeff Bolling, Gulf Sales Engineer, about the excellent results obtained with Gulfcut Heavy Duty Soluble Oil.

Gulfcut Heavy Duty Soluble Oil

Now you can make heavier cuts... at higher speeds... with longer tool life... even in turning such alloys as chrome-nickel steels!

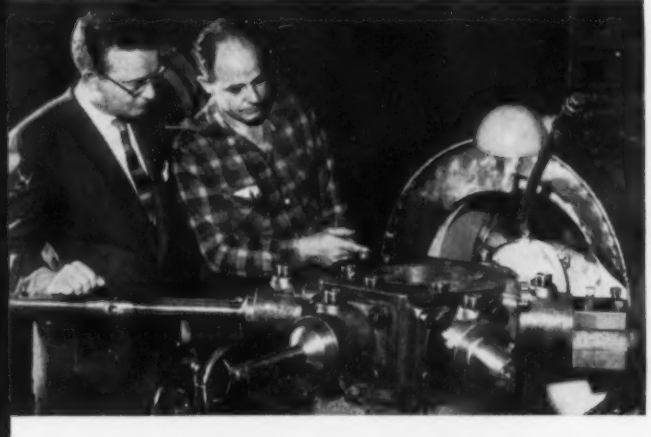
Here's a completely new emulsifying oil—developed over the past 6 years in Gulf's research laboratories! Gulfcut Heavy Duty Soluble Oil performs efficiently even on low machinability metals. It has a record of proven performance on tough jobs where most soluble cutting oils have trouble meeting requirements.

Gulfcut Heavy Duty Soluble Oil is economical, too: an average mixture of 1 part to 25 parts of water gives high cooling efficiency, and superior lubrication. In many field tests, it has performed very well even in mixtures of 1-to-150!

Will not separate or gum!

This shop-proved new soluble cutting oil won't separate or gum in wheels, slides, ways or other machine parts. It contains a potent rust inhibitor which provides greater protection against rust and corrosion. Has excellent emulsion stability, even in hardest water. Has high surface-wetting properties for more effective cooling. Contains powerful anti-foaming and anti-welding agents. Also contains an effective germicide to help eliminate rancidity and odor.

Is your production hampered by your present soluble oil? When turning metals of low machinability, are you forced to take light cuts, at slower speeds and feeds? To improve production, get better surface finishes, longer tool life, lower overall operating costs—try new Gulfcut Heavy Duty Soluble Oil. Call the Gulf Engineer, at your nearest Gulf office—or write for illustrated booklet.



GULF OIL CORPORATION
Dept. DM, Gulf Building
Pittsburgh 30, Pa.

GULF

THE FINEST PETROLEUM PRODUCTS FOR ALL YOUR NEEDS

EXHIBITS, MEETINGS

(Continued from P. 13)

Inc.—Convention, Jan. 26-Feb. 2, Algiers Hotel, Miami Beach, Fla. Society headquarters, 29 Broadway, New York 6.

Industrial Heating Equipment Assn.—Annual meeting, Jan. 27-28, Penn-Sheraton Hotel, Pittsburgh. Society headquarters, 1145 19th St., N. W., Washington 6, D. C.

Society of Plastics Engineers, Inc.—Annual technical conference, Jan. 28-31, Sheraton-Cadillac Hotel, Detroit. Society headquarters, 34 E. Putnam Ave., Greenwich, Conn.

FEBRUARY

Malleable Founders Society—Technical and operating conference, Feb. 6-7, Wade Park Manor, Cleveland. Society headquarters, 1800 Union Commerce Bldg., Cleveland.

American Society for Quality Control—Annual conference on management by exception, Feb. 7-8, Carter Hotel, Cleveland. Information: B. F. Goodrich Chemical Co., 3135 Euclid Ave., Cleveland.

Institute of Surplus Dealers—Annual trade show and convention, Feb. 14-17, New York Trade Show Bldg., New York. Society headquarters, 673 Broadway, New York 12.

American Institute of Mining, Metallurgical & Petroleum Engineers—Annual meeting, Feb. 16-20, Hotels Statler and Sheraton-McAlpin, New York. Society headquarters, 29 W. 39th St., New York.

MARCH

American Machine Tool Distributors' Assn.—Spring meeting, March 10-11, The Roosevelt, New Orleans, La. Society headquarters, 1900 Arch St., Philadelphia 3.

Steel Founders' Society of America—Annual meeting, March 17-18, Drake Hotel, Chicago. Society headquarters, 606 Terminal Tower, Cleveland 13.

The Secret of Mass Producing Intricate Springs...

Mid-Continent Spring Co. men, machines and Keystone Wire make difficult jobs easy!

There's no secret to mass producing complicated springs at Mid-Continent Spring Company, St. Louis, Mo. Experience – ingenuity – specially designed spring machines – and Keystone MB Hard Drawn Wire – combine to produce hitherto impossible or impractical springs. At this progressive firm's modern factory you'll find incredibly intricate spring machines performing multiple operations at high speed, producing everything from hair springs to springs for heavy machinery.

An important part of the secret to successful spring manufacture is the selection of a quality wire – and here's how Mid-Continent feels about Keystone Wire. "We like Keystone Wire for its uniformity, true roundness and absolute tensile. For instance, on a recent run of 125,000 lbs., less than 1/10 of 1% did not meet our critical specifications."

The excellent performance of Keystone MB Spring Wire *is* due to its consistent uniformity of composition, temper and diameter. Keystone MB Spring Wire is also available in drawn galvanized and copper coated finishes, as well as spheroidized annealed temper.

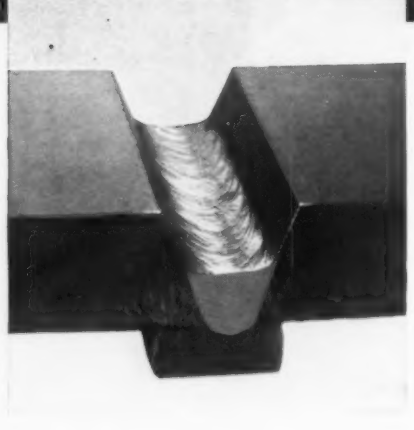
For the difficult shapes and springs – as well as for the easy jobs – Keystone Wire can assure you steady production and fewer rejects. Your Keystone Wire Specialist, backed by a skilled metallurgical staff, will gladly help you solve your wire problems. Call us . . . today!

Keystone Steel & Wire Company
Peoria 7, Illinois

KEYSTONE
WIRE FOR INDUSTRY

Weldynamics

ARC WELDING AT WORK CUTTING COSTS



A special Jetweld for deep groove welds

Jetweld 2 is a special electrode designed particularly for groove welding. The high deposition rate gives maximum speed in fabrication. The excellent wash-up characteristic and complete freedom from undercut makes the slag easy to remove. Deposits are uniformly of X-ray quality.

No electrode gives faster welding and lower cleaning time. Try Jetweld 2 in your shop.

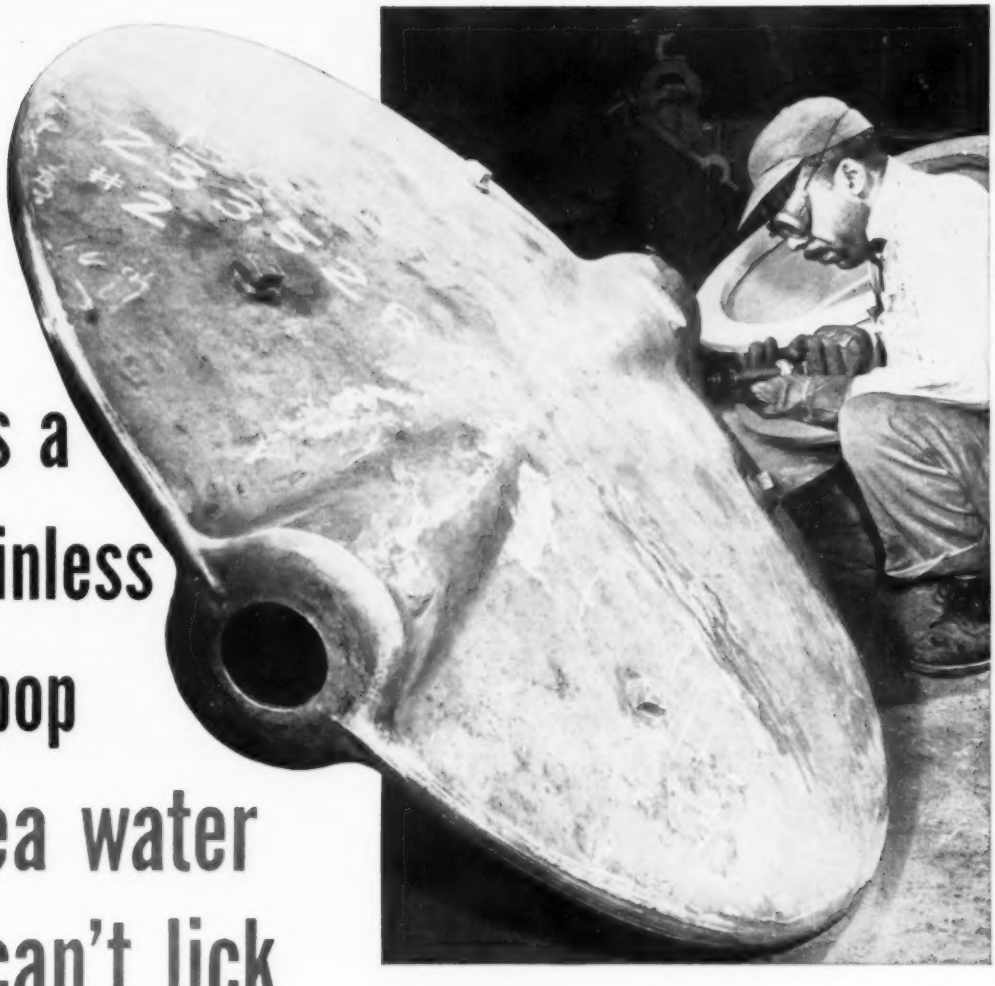
Lincoln men, trained in Weldynamics, will help you select the best electrode, machine and procedures for lowest welding costs.

Write for Bulletin 7000.1, New Weldirectory of Lincoln Mild Steel Electrodes.

The World's Largest Manufacturer of Arc Welding Equipment

THE LINCOLN ELECTRIC COMPANY, DEPT. 1537, CLEVELAND 17, OHIO

Here's a stainless lollipop sea water can't lick



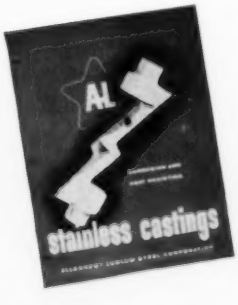
This large (48″ dia., 1701 lbs.) and unusual stainless casting was fabricated by Allegheny Ludlum's Buffalo, N.Y. foundry. It is scheduled for service under the most severe operating conditions, functioning as a wafer valve disc at 25 psi pressure in sea water. Since long life and tight closing are essential in this application, corrosion resistant Type 304 Allegheny Stainless was specified.

Some unusual techniques were employed in the fabrication of this casting. Although the entire valve disc was cast as a single piece, its sides are hollow, with a skin only ¾″ thick. The center shaft was cast solid at the same time the side wings were cored, permitting the single piece, seamless part desired.

If you have a casting problem, or *any* problem that involves corrosion resistance, long life, resistance to wear and abrasion, call the Allegheny Ludlum Sales Office nearest you. An A-L Sales Engineer is ready to put his skills and those of the A-L Technical Staff promptly at your disposal, to serve your requirements from the largest and most complete line of stainless products on the market.

Allegheny Ludlum Steel Corporation, Oliver Building, Pittsburgh 22, Pennsylvania.

WSW 6663



Write for this 28-page booklet on A-L STAINLESS CASTINGS

28 pages of valuable and complete data on stainless castings: analyses, properties, technical data on handling and heat treatment, typical applications, how to order, etc.

ADDRESS DEPT. A-1a

Make it BETTER and LONGER LASTING with

ALLEGHENY STAINLESS

Warehouse stocks carried by all Ryerson steel plants

Sand . . . heavy rain . . . extreme heat . . .

Nothing stops These Westinghouse Life-Line A Motors

dependably driving oil well pumps in Odessa, Texas district of The Atlantic Refining Company, 24 hours per day, 7 days a week!

"Here's an application," says A. P. Johnston, production engineer at The Atlantic Refining Company, "where we must have continuous motor operation . . . sometimes for as long as 18 months . . . with virtually no maintenance or repair. Many of our pumping stations are remotely located, automatic and unmanned. Any stoppage or motor failure would result in the loss of several hundred barrels of oil. Motor repairs in the field are prohibitive in cost. We must have *complete* motor reliability and that's exactly what we get from our Westinghouse Life-Line® "A" motors."

How about you? Got a really tough motor application which you can't afford to pamper? Then ask your Westinghouse sales engineer to show you how the dependable Life-Line "A" pays for itself through reduced maintenance and repair. Or write to Westinghouse Electric Corp., P.O. Box 868, 3 Gateway Center, Pittsburgh 30, Pennsylvania.

J-22055

YOU CAN BE SURE...IF IT'S Westinghouse

On this pumping unit, the 15-hp Life-Line "A" motor operates in an atmosphere of damaging dust, sand and moisture. Despite continuous, heavy-duty service, motor has never suffered any overheating since first installed. Prelubricated bearings of the Life-Line "A" eliminate periodic greasing . . . keep lubricant in . . . dirt out.

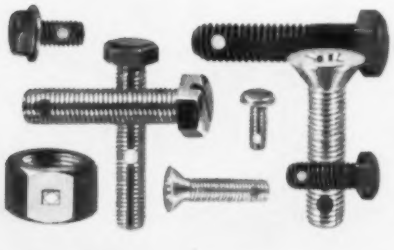
Republic Fastener Reliability Protects Final Assembly Performance

"For the want of a shoe the horse was lost" so wrote Benjamin Franklin in Poor Richard's Almanack, 1758.

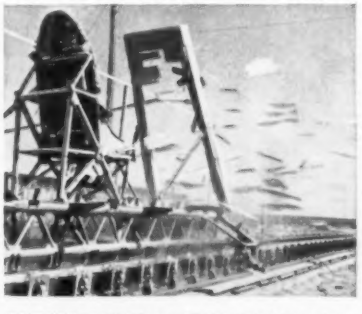
The same thinking applies to your assembled products. The effort and expense you spend in design and manufacture deserve to be backed by quality fasteners.

When you specify Republic Bolts and Nuts, you get fasteners that are made under a single standard of quality control from iron ore through finished product. This single-standard control, verified by test and inspection, assures you of fasteners that never vary from lot to lot, from year to year—always top-quality, always predictable in assembly and performance. As a result, your finished product is protected. You can count on Republic Fasteners to see you safely through any fastening problem demanding maximum reliability.

So don't just order fasteners, *select* Republic and be sure of the best. Contact your local Republic representative or distributor and choose the types and sizes you need from a variety of over 20,000 standards and 8,000 specials. Or, for illustrated literature, mail coupon.



RELIABLE LOCKING is provided by Republic Nylok® Bolts and Nuts wherever wrenching stops. Resilient, permanent nylon insert forces a vibration proof metal-to-metal lock between opposite mating threads. As a result, Nylok fasteners can be reused, are ideal for adjustable applications and require no supplementary locking devices. Write for literature.



MAXIMUM-PERFORMANCE STRUCTURES able to withstand multiple forces can be designed to avoid excessive weight by taking advantage of the high strength-to-weight ratio of Republic ELECTRUNITE® Mechanical Tubing. The ELECTRUNITE Process assures tubing with uniform strength, wall thickness and concentricity. Send coupon for complete application information.

PROTECT IN-PLANT SHIPMENTS of practically any type and shape of material with Republic Materials Handling Equipment. Whatever your requirements, our Pressed Steel Division is well qualified to develop special box, skid and pallet designs to serve you efficiently. For more routine handling problems, Republic offers a wide variety of standard equipment.

STEEL

and Steel Products

REPUBLIC STEEL CORPORATION
DEPT. C-3423
3104 EAST 45th STREET • CLEVELAND 27, OHIO

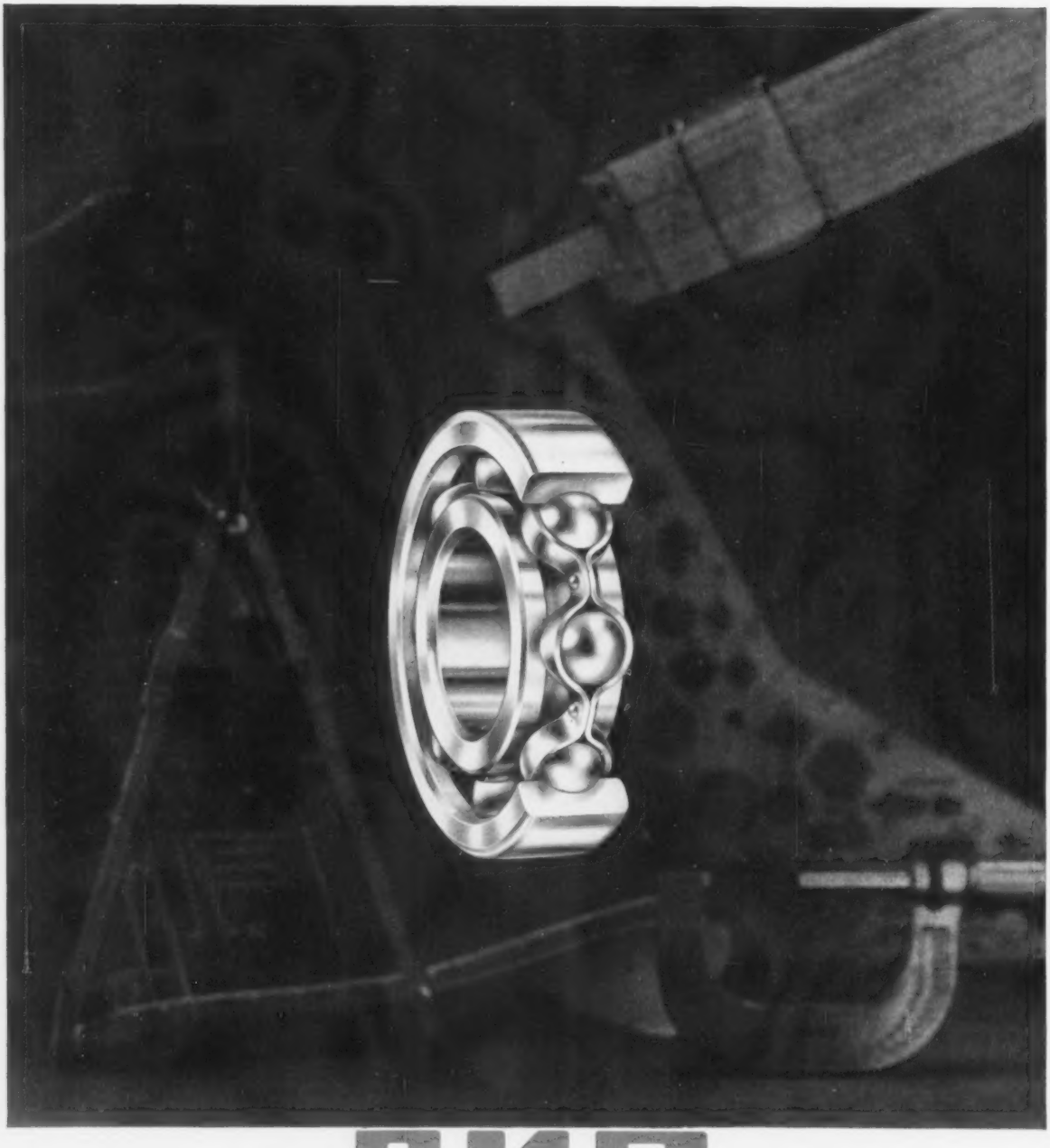
Please send me data on:
☐ Fastener Products ☐ ELECTRUNITE Mechanical Tubing
☐ Nylok Fasteners ☐ Materials Handling Equipment

Name_____ Title_____

Company_____

Address_____

City_____ Zone____ State_____



SKF

BEARINGS FIT INTO YOUR PLANS

You'll find that high quality SKF anti-friction bearings fit readily into any design. SKF makes a complete line of the four basic types, in over 3,000 sizes, ranging from the smallest to the largest—your best assurance of receiving unbiased advice from experienced SKF engineers. Plan now to simplify the problem of selecting the right bearing for your application. Just call the nearest SKF district office today.

7808

SKF

EVERY TYPE—EVERY USE

Spherical, Cylindrical, Ball, and "Tyson" Tapered Roller Bearings

*"Reg. U.S. Pat. Off.

SKF INDUSTRIES, INC., PHILADELPHIA 32, PA.

NEW! from Erie Foundry Co.

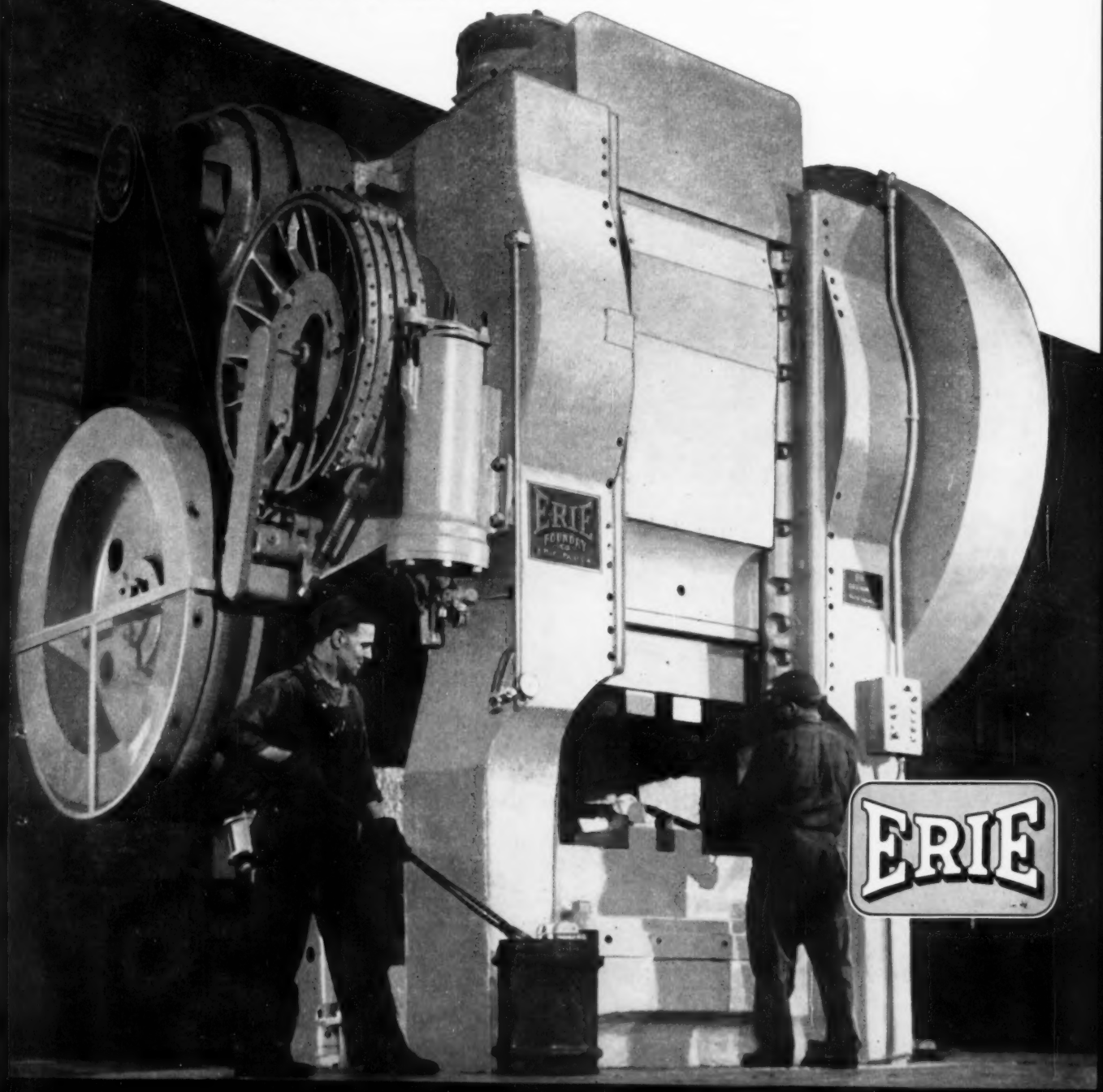
Mechanical Forging Press

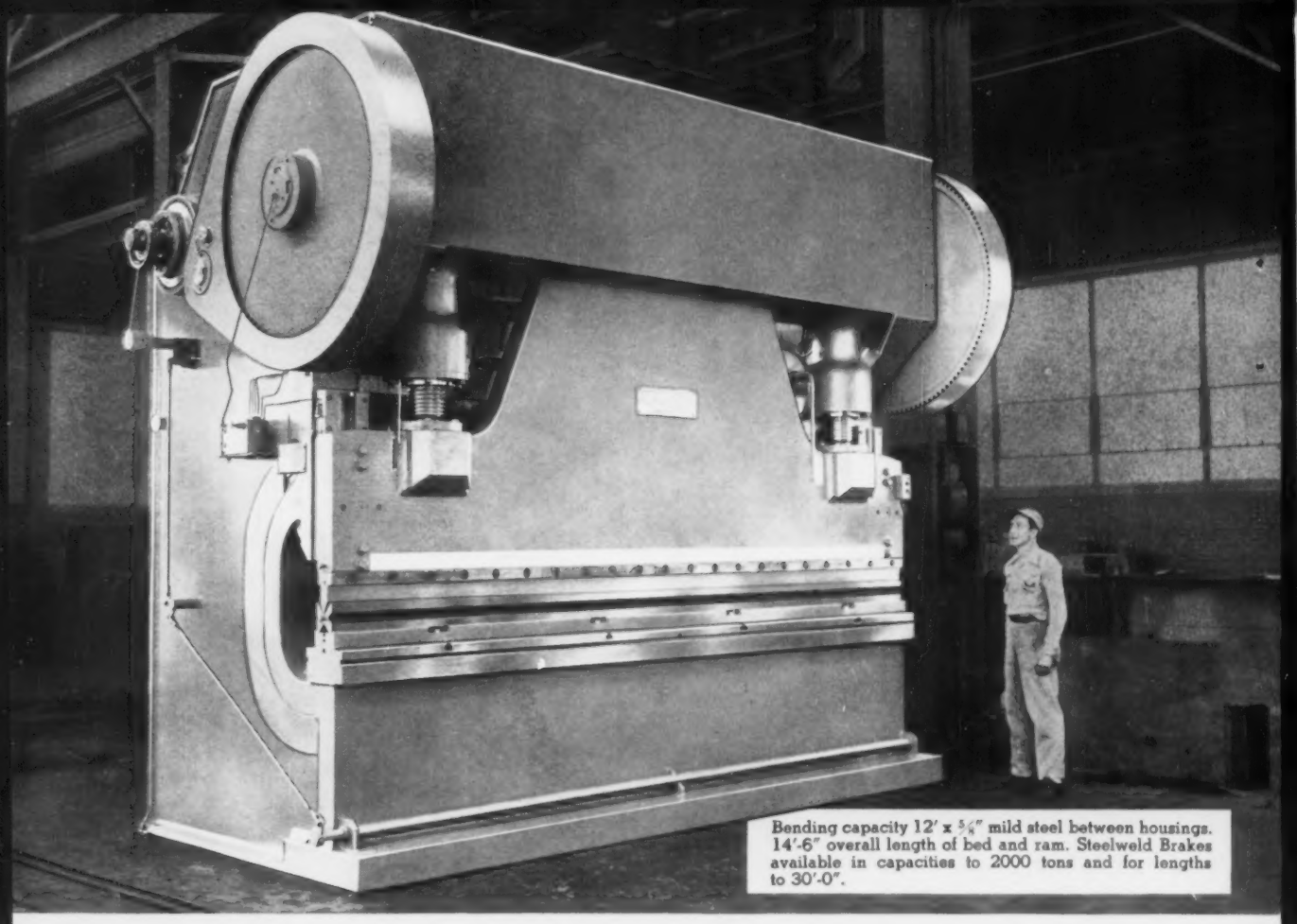
By eliminating the conventional pitman, Erie's new mechanical forging press is rugged, more rigid, and more compact. Guiding is unusual, too.

You are invited to see this press in operation at the Erie Foundry plant. Please call or write Mr. Claude L. Boring, General Manager, for an appointment.

Greatest name in forging machinery—Since 1895

ERIE FOUNDRY CO.
ERIE 1, PA.





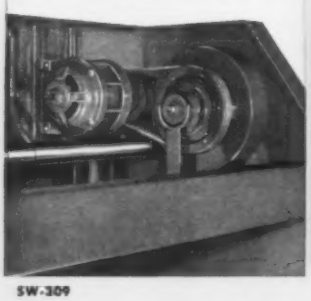
Bending capacity 12′ x 5/8″ mild steel between housings. 14′-6″ overall length of bed and ram. Steelweld Brakes available in capacities to 2000 tons and for lengths to 30′-0″.

BRAKES and SHEARS BUILT

STEELWELD machines are built to withstand the rigors of mass-production high-speed work, as well as meet the needs of jobbing shops requiring frequent set-up changes. They are liberally designed throughout to assure maximum service with minimum maintenance. A wide array of desirable features are provided, some of which are not available elsewhere.

Steelweld Brakes and Shears are easily adapted for special requirements. Our engineers will be glad to work out design changes to speed production, improve safety or bring about other advantages for specific applications.

A Few of the Outstanding Press Brake Features



SW-309

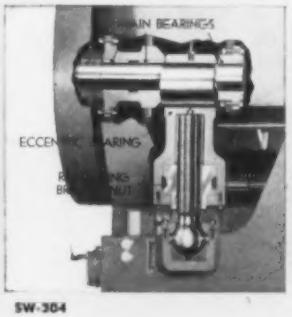
Long Life Clutch and Brake

Heavy construction assures long trouble-free life. Clutch unit is duplicate of brake and parts interchangeable. Adjustments easily made without tools.

SW-458

Slides Compensate For Wear Automatically

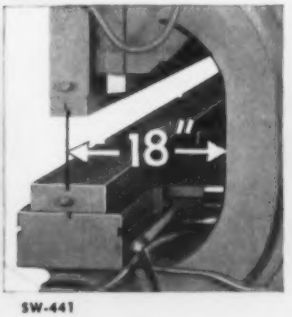
V-shaped slides and guides eliminate loose gibbing. Take up wear automatically. Easily removed and replaced.



SW-304

Six Large Main Bearings

Each of the two eccentric shafts which drive the ram has three heavy bronze bearings. Ram adjustment is made by revolving nut. Screws do not turn; therefor, ball joint wear is reduced.



SW-441

Extra Deep Throat

18-inch throat is standard on all Steelweld Brakes. This permits making bends to 18 inches from edge of plate for full length of dies.

Shearing capacity 18′ x ½″ mild steel. 35 strokes per minute. Steelweld Shears available for cutting plate to 30′-0″ and for thicknesses to 2 inches.

FOR **HEAVY DUTY** SERVICE

Many Important Shear Advantages

1. Pivoted blade operation.
2. No slides or guides to wear.
3. Knife clearance easily adjusted to suit plate thickness.
4. Smooth, sharp accurate cuts.
5. Low rake.
6. Negligible twist, camber and bow in cut pieces.
7. Fast cutting and high production.
8. Easy and simple to operate.
9. Convenient electric foot control.
10. Trouble-free mechanical hold-downs.
11. Easily arranged for squaring, slitting and notching.
12. Convenient, accurate, ball-bearing mounted back gauge.
13. Quiet operating.
14. Designed for safety throughout.
15. Long knife wear between grindings.
16. Knives easily removed and replaced.
17. All-welded one-piece frame with bed integral.

GET THESE BOOKS!

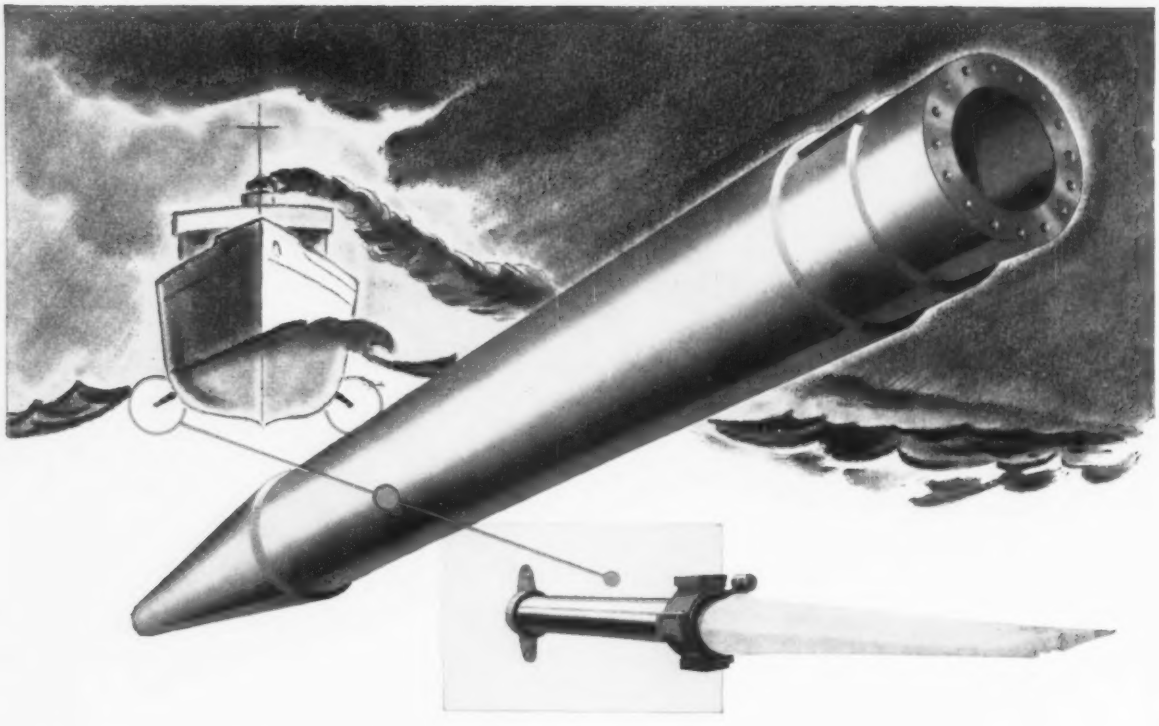
Catalogs No. 2010 (Brakes) and No. 2011 (Shears) give construction and engineering details. Profusely illustrated.

THE CLEVELAND CRANE & ENGINEERING CO.

4857 EAST 282ND ST. *WICKLIFFE, OHIO*

STEELWELD

BRAKES and SHEARS

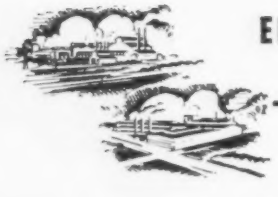


35,000 Pounds of Forged Steel . . .
"Giant Muscle" to Fight the Sea

Counter punching against the buffeting of heavy seas requires the sturdiest kind of stabilizing mechanisms on modern naval and merchant ships. Hence, the use of the forged steel shaft which controls the stabilizer fins in the assembly shown above.

Forged and machined to 35,000 pounds, this steel shaft is 29 feet 8 inches long. Body diameter is 25¾ inches and the shaft is bored and honed to 14 inch diameter 17½ feet in from the flange end.

Bearing the brunt of storms at sea, this "giant muscle" is at the heart of modern stabilizers in ships of widely diverse tonnage plying the seven seas today. Another example of the versatile capabilities available at Erie Forge & Steel. Strict quality control from raw materials to finished steel forgings and castings within our own plants are yours here "Under One Responsibility and One Control". Your nearest field sales engineer will be in very soon to discuss your requirements with you.



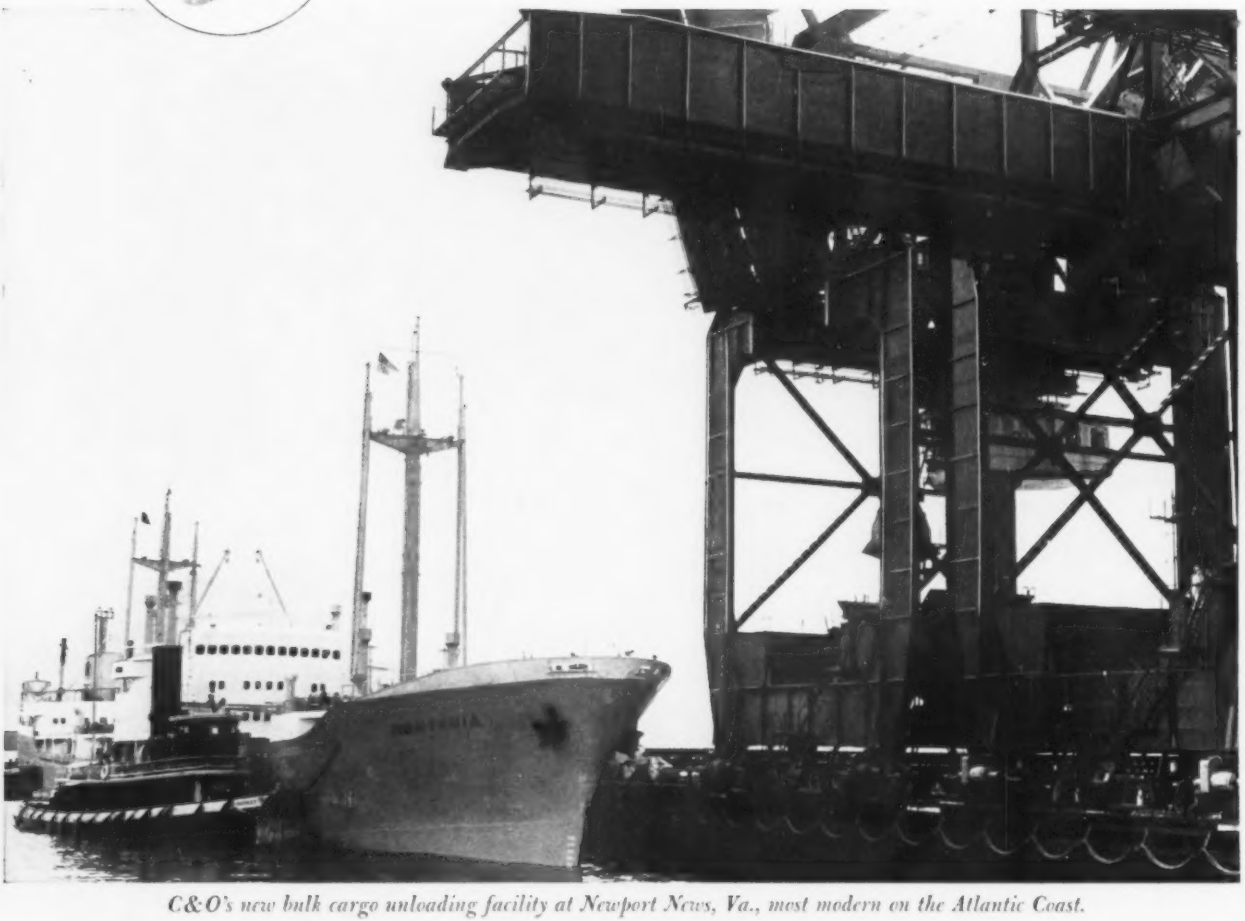
ERIE FORGE & STEEL CORPORATION

ERIE, PENNSYLVANIA

MEMBER AMERICAN IRON AND STEEL INSTITUTE

ERIE FORGE & STEEL CORPORATION

Bulk cargo



C&O's new bulk cargo unloading facility at Newport News, Va., most modern on the Atlantic Coast.

Buckets to handle various types of ore or vessel range from 18 tons to 6 tons capacity. Buckets can be changed in less than five minutes.

Each open top car is thoroughly flushed out before loading with ore.

"on the double"

Twin conveyors and car loading hoppers handle two types of ore at the same time without sacrifice of loading speed.

Electronic weighing, accurate to the pound, eliminates track scales.

Chesapeake and Ohio's newly completed bulk cargo unloading facility at Newport News, Va., is handling a fast-growing flow of import ores and other bulk cargoes with record-breaking speed and efficiency. Using the best features of American and European designs, the facility's three unloaders are the "slewing jib" type in which 190-ton gondolas, carrying an operator, controls and hoisting machinery, move on trolleys to pick up and discharge in 45-second cycles their 18-ton loads. Turning in full circle, they clean out every corner of a ship's hold without auxiliary equipment aboard ship. Moving on rails along the finger type pier, designed to accommodate the largest ore carriers afloat, the unloaders simultaneously work ships on either side of the pier.

Coupled with C&O's ready car supply and swift rail movement inland, this $8½ million installation offers ore importers a new standard of transportation service. For ships, it means faster turn-around at Chesapeake and Ohio's "Quick Access" port of Newport News on Hampton Roads.

Write for illustrated folder showing in detail the operation and advantages of C&O's new bulk cargo unloading facility.

Chesapeake and Ohio Railway

WORLD COMMERCE DEPARTMENT, NEWPORT NEWS, VA.

World Commerce Dept. Offices: New York 7, N. Y., 233 Broadway • Chicago 4, Ill., 327 LaSalle Bldg. • Detroit 26, Mich., 525 Lafayette Bldg. • Richmond 10, Va., 823 East Main St. • Stockholm, Sweden, Kungsgatan 7

This beautiful, new overpass erected at Winthrop, Maine has sidewalk railings made of Continuous Weld Yoloy Steel Pipe. Yoloy's extra strength and excellent corrosion-resistance are qualities required for applications of this type.

"Yoloy" pipe is on the job

. . . providing strong, corrosion-resistant bridge railings for Maine State Highway Commission

Maine chose Yoloy! It proved so easy to fabricate and weld that 2 additional Maine bridges will have Yoloy railings. This nickel-copper alloy steel also demonstrates added strength and longer life making it an ideal structural pipe!

Available in Sheets, Plates, Bars, Shapes, Cold Drawn Bars and Tubular Products, Youngstown's complete family of Yoloy steels provides the right grade for each of your specific jobs. Complete informative Data Sheets on each Yoloy steel will be sent you promptly upon request.

OVERPASS AT WINTHROP, MAINE ERECTED FOR THE BRIDGE DEPARTMENT OF MAINE STATE HIGHWAY COMMISSION. YOLOY PIPE WAS SOLD THROUGH JOBBER W. L. BLAKE CO., PORTLAND, MAINE, TO BANCROFT & MARTIN ROLLING MILLS CO., SOUTH PORTLAND, WHO FABRICATED THE BRIDGE RAILINGS. CIANCHETTI BROS., INC., PITTSFIELD, MAINE, ERECTED THE SECTIONS FOR GENERAL CONTRACTOR H. E. SARGENT, INC., STILLWATER, MAINE.

PHOTOS COURTESY OF MAINE STATE HIGHWAY COMMISSION

THE YOUNGSTOWN SHEET AND TUBE COMPANY
Manufacturers of Carbon, Alloy and Yoloy Steel
General Offices - Youngstown 1, Ohio
District Sales Offices in Principal Cities

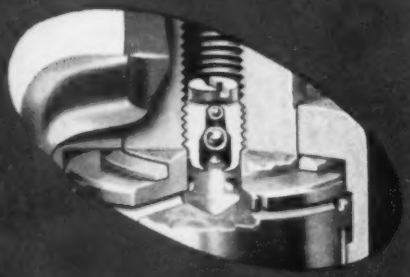
QUALITY YOUNGSTOWN SERVICE

WRITE FOR THESE FREE PAMPHLETS IN THE YOLOY FAMILY SERIES:

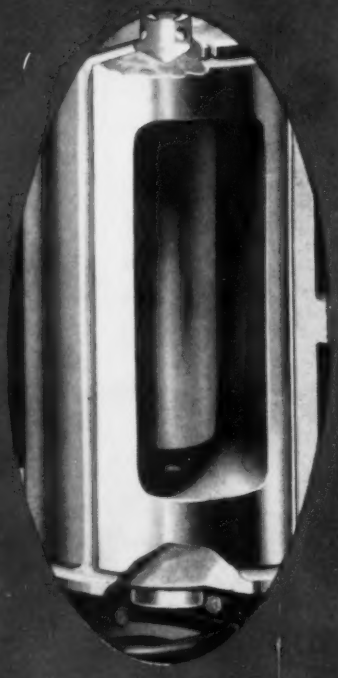
YOLOY "E"	HIGH STRENGTH LOW ALLOY STEEL-STANDARD APPLICATIONS
YOLOY	HIGH STRENGTH STEEL-SPECIAL APPLICATIONS
YOLOY "S"	HIGHER STRENGTH STEEL FOR INCREASED SERVICE LIFE
YOLOY "C"	CORROSION RESISTANT GRADE FOR DEEP FORMING
YOLOY PIPE	CONTINUOUS WELD FOR CORROSION RESISTANT APPLICATIONS

In the spots that count...Homestead Valves are

LEAKPROOF



Reinforced Teflon and lubricant seal



Controlled pressurized lubricant seal

Lower cost per year valve service is guaranteed by Homestead Lubricated Plug Valves. These are the features that make them leakproof and extend their useful life . . . reinforced Teflon* head seal, double ball and lubricant sealed check valve, and their exclusive controlled pressurized lubricant seal.

Homestead's controlled lubricating system forces a chemical film over all sealing surfaces at more than 300 pounds pressure. In addition, it prevents sticking, by its piston-like movement of the plug during each lubrication. See how Homestead fills your valve needs. Write today for Reference Book 39, (Section 5), for complete information on Homestead Lubricated Plug Valves.

**DuPont registered trademark.*

h
v

HOMESTEAD VALVE MANUFACTURING COMPANY

P. O. Box 23 • Coraopolis, Pa.

A new name in metals—American Metal Climax, Inc.—arises from the merger of two well-known companies, The American Metal Company, Ltd. and Climax Molybdenum Company.

American Metal Climax, Inc. now offers expanded facilities and services. Its activities include mining, smelting, refining, marketing, exploration and research. Its products are molybdenum in all forms, potash, copper, lead, zinc, uranium, vanadium, tungsten, tin, solder, metal powders, precious and rare metals, selenium, germanium, tellurium, cadmium, cobalt, bismuth, arsenic, oil and gas, and others. Its interests circle the globe; principal business activities are in North America, Western Europe, and Africa.

AMERICAN METAL CLIMAX, INC.
61 Broadway, New York 6, New York

Climax Molybdenum Company—a Division
500 Fifth Avenue, New York 36, New York

Principal Subsidiaries of American Metal Climax, Inc.

AMERICAN CLIMAX PETROLEUM CORPORATION
New York, New York

THE AMERICAN METAL COMPANY OF CANADA LIMITED
Toronto, Ontario, Canada

THE ANGLO METAL COMPANY LIMITED
London, England

BLACKWELL ZINC COMPANY, INC.
Blackwell, Oklahoma

CÍA. METALÚRGICA PEÑOLES, S.A.
Monterrey, Mexico

CÍA. MINERA DE PEÑOLES, S.A.
Monterrey, Mexico

CLIMAX URANIUM COMPANY
Grand Junction, Colorado

HEATH STEELE MINES LIMITED
Newcastle, New Brunswick, Canada

RHODESIAN SELECTION TRUST LIMITED
Salisbury, Southern Rhodesia

SOUTHWEST POTASH CORPORATION
Carlsbad, New Mexico

UNITED STATES METALS REFINING COMPANY
Carteret, New Jersey

No-Current Plate Stripper

Plated deposits can be stripped from ferrous-base metals without the use of electrical current. A flaky, light organic compound is combined with sodium cyanide and dissolved in water. The solution removes copper, nickel, cadmium, zinc and silver deposits without etching the base metal. Equipment needed: a still tank, draft box, coil and temperature regulator.

Oxygen for Armco?

Rumors of an oxygen converter for Armco Steel Corp.'s Ashland, Ky., works are running high. The firm is adding a blast furnace and has said it will need more steelmaking capacity there. The need could become urgent, since a proposed union with National Supply would give Armco pipe mills capable of 700,000 tons annual output.

Slump in Ore Shipments

Look for shipments of iron ore to drop sharply this year. Major mills had to commit themselves for the fall shipping season early in the second half of 1957. Because they overestimated their needs, they finished up the year loaded with ore. Heavy inventories plus production cutbacks point to reduced mining and shipping activities.

More Safety for Autos

A new type of instrument panel for cars would be mounted to slide on tracks, using shock absorbers behind the panel to cushion the effect of sudden impact. Such a panel, it's claimed, would be far superior to padded types now in use. However, cost of the special construction is a factor, as is design of the necessary flexible connections.

Step Weld for Safe Repair

Repair of a cracked 5-ton crankshaft casting points to the success of arc welding in a series of stress-relief steps to insure weld soundness. Even if the weld deposit is carried beyond safe thickness, cracking will only penetrate to the underlying stress-relieved area. Thus, only defective weld metal need be removed and replaced to maintain full quality control.

Auto Design Shifts Gears

Design staffers assigned to an "all new" medium price car are looking over their shoulders for the boss. Some of their 1959 design work that was well along has been stopped abruptly. This fact, coupled with less-than-hoped-for sales of higher-priced offerings in the line, indicate the top dollar models might be dropped. Emphasis would then be concentrated on the better selling numbers.

New Design Boosts Tap Life

To extend tap life, a new continuous-spiral-point design forces lubricant to the cutting edge. It also pushes chips ahead to eliminate the problem of clogged flutes. Because taps come with either single or multiple chamfer sections, an entirely new cutting section (with proper chamfer and point grind) can be had without need for resharpening or tap replacement.

Politicos Need Advice

Here's further evidence of Washington's booming interest in science: Congressional thinking that each member of the President's Cabinet should have a "science advisor." The idea is that top officials need to know more about scientific subjects these days.

Gains for Aluminum Cans

Aluminum container products could take over from the building industry as the No. 1 user of the light metal, an aluminum executive opines. Even if aluminum captures only 10 pct of the existing can market, he says, it would take 200,000 tons of metal annually to do the job. That's about 10 pct of the industry's production capacity right now.

There's only one fingerprint like this ☞

and there's only one trade-mark like this ☞

TIMKEN®

THERE'S only one registered trade-mark that says "Timken". It belongs to The Timken Roller Bearing Company, alone. You'll find it on every Timken Company product, whether it's tapered roller bearings, fine alloy steel bars, seamless steel tubing or removable rock bits.

When you see the trade-mark "Timken", you can be sure the product it marks is highest quality. Quality that is known and looked for throughout industry. Quality that is backed by more than 55 years of experience—guarded by 15,000 Timken Company employees.

That's why it's worth your while to remember that "Timken" is a trade-mark, not just a type of product. When you want the best, look for the trade-mark "Timken". It's the name you know means highest quality.

The Timken Roller Bearing Company, Canton 6, O. Canadian plant: St. Thomas, Ont. Cable: "TIMROSCO".

TAPERED ROLLER BEARINGS • REMOVABLE ROCK BITS • FINE ALLOY STEEL

How Geography Dictates Auto Assembly Plant Location

Chrysler Move Illustrates the Pattern

When Chrysler had to replace its outmoded Evansville assembly plant, it went to a location closer to its markets.

Trend to "custom" mass production places a premium on proximity to selling areas.

Indiana city faces facts, determines to go after new industry.—By H. R. Neal.

▪ The city of Evansville, Ind., was shocked recently to learn that it is going to lose one of its oldest and largest employers.

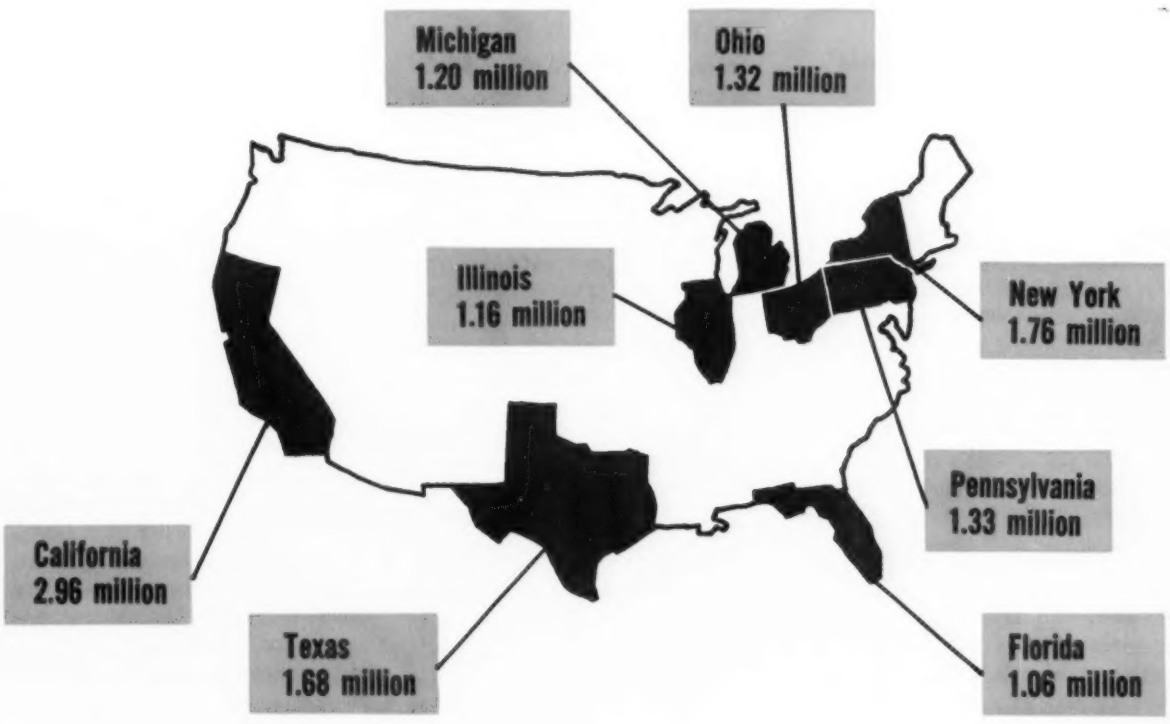
Decision of Chrysler Corp. to abandon its old body manufacturing and Plymouth assembly plant at the end of the 1959 model run threw the city into a mild state of panic. The operation will be transferred to a new, modern, $50 million plant at Valley Park, Mo., 20 miles from St. Louis.

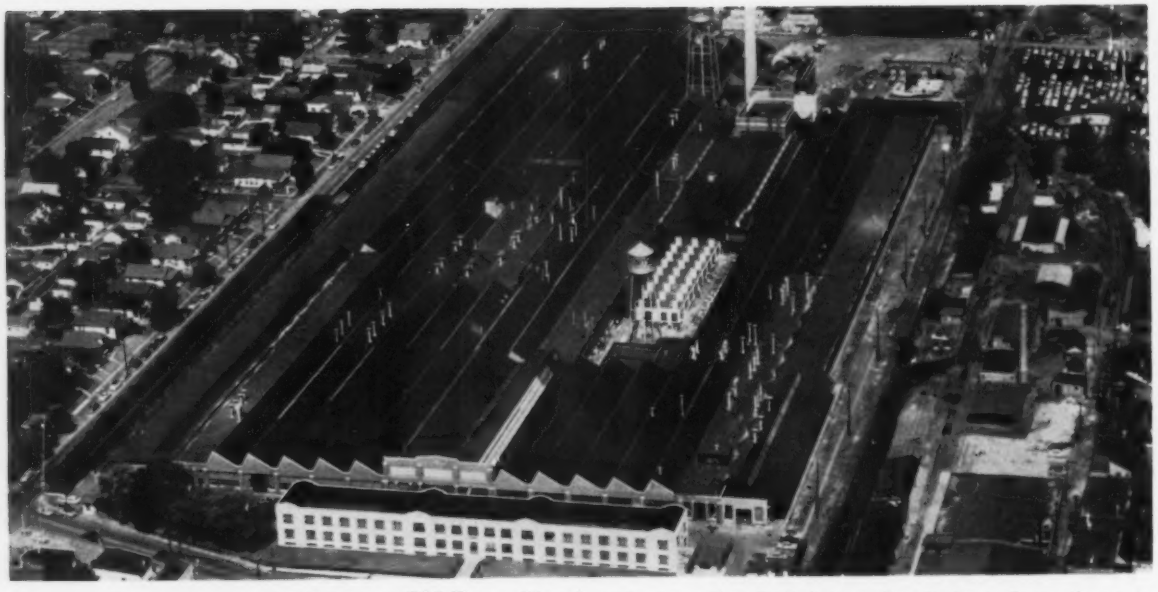
Part of a Pattern—Chrysler officials were hard-pressed to explain the decision to their Evansville workers and to city officials. But it was a decision not new to the auto industry.

The Evansville situation is more dramatic since it involves closing a going plant to build another. How-

Automakers Move Assembly Plants to Serve Growing Markets

Increase in Passenger Car Registration 1941-1956





OLD Old Evansville plant is type that is being replaced throughout the auto industry. The building itself was probably doomed even if geography had not dictated moving to a site closer to growing market areas.

ever, it follows a pattern that is forced on the auto industry. It must move closer to its growing markets.

This is a decision forced by more than changing population and simple geography. The demands of the auto buyers themselves force the industry to locate its assembly plants closer to its customers.

"Custom" Mass Production — Chrysler president L. L. Colbert points out how the competitive factors and the complexities of the market influenced the decision.

"Today, with all of the options available to the customer and the various color combinations, we are in a position of mass producing a custom automobile. We find ourselves building a car today that the dealer sold yesterday."

An idea of what Mr. Colbert means can be gained by a look at some of the options a customer has. Plymouth offers six engines in 1958 models. There are three transmission options and several rear axle ratios available.

More and More Options — The engines go into a choice of up to 19 different models. These, in turn, can be had in a range of 15 exterior colors and 88 two-tone combinations.

Then there is the question of optional power equipment: Power brakes, power steering, seats, windows, heater, air conditioner, radio, back-up lights, windshield washers, whitewall tires, dual exhausts, tinted glass and many others.

Premium on Delivery—With today's buyer growing more particular, he virtually names his own "custom" car. More and more, dealers order what the customer wants, placing a premium in proximity of the assembly plant.

Savings in transportation costs are important. This is how it affects the Evansville move:

In addition to being situated in the middle of one of the largest markets, St. Louis itself, the new plant will be some 170 mi. closer to several other big markets. These include Oklahoma City, Houston, Dallas, Ft. Worth and Denver.

New Plant Needed—William C. Newberg, Chrysler automotive group vice president, said the dominant economic factor involved is transportation costs.

"It has been apparent for some time that our present 30-year-old Plymouth Evansville operations would have to be replaced with a new, modern assembly plant to serve today's changing automobile market in the south-central and southwest," he said.

". . . Our studies indicate that significant economic competitive factors peculiar to our business weigh substantially in favor of the new area, particularly in the matter of freight costs.

"Another important factor dictating our decision is the fact that we will be in a better position to serve our dealers and customers more quickly and with better service.

Taxes and Labor—Other factors, particularly labor and taxes, have been cited as possible reasons for the move. There is no doubt but that these factors have been important in other automotive plant locations, but not in the Evansville situation.

Chrysler operates five other plants in Indiana, representing more Chrysler facilities in any single state except Michigan. The company has carried on sizable modernization and expansion programs in these plants.

NEW

New plant to be built near St. Louis will be of modern construction and layout and will be one of the most efficient assembly plants in the industry. It will turn out cars at the rate of 60 per hour.

In regard to labor, the company points out that it would have the same union, many of the same employees, and the same pay rate.

So Evansville lost Chrysler to geography, a dominant factor in the changing of the auto industry's assembly map.

Community Effects — But inevitable or not, the move will have a major effect on the city, Chrysler employees, and to the community as a whole.

Ray Blythe, president of UAW Local 265 at the body plant, says the company will have to give Evansville employees the option of moving to the new St. Louis plant. But it will be up to each employee. He, for one, will move.

"There's no choice in the matter," he says. "I've worked for Chrysler for 22 of my 44 years. I have seniority, and where else would I get a job at my age. But some of the workers don't feel that way, and they have their own reasons for deciding to stay. I've lived here a long time and this isn't the end of the line for Evansville.

"A lot of people will change their minds over going or staying. . . . It's still 18 months away and if job prospects are good, more will stay. If times aren't so good, some will change their minds and decide to move."

Previous Experience — It's difficult to say how many will move, if given the opportunity. A Chrysler official points out that about 60 pct of the 1300 employees at the firm's Twinsburgh, O., stamping plant are former Detroit employees who moved when the company shifted some operations to the new plant.

One employee, probably in a minority, said: "Frankly, I'm surprised Chrysler stayed here as long as it has. These are pretty old plants. If the new plant will employ about 3500 and we have 6000 here, they're losing a lot of money by staying.

What's ahead for Evansville?

City Has Assets — The community is taking stock. In spite of the Chrysler move, Evansville has geographical assets. Even Mr. Newberg admitted its location near the population center of the country, excellent transportation facilities, and the availability of skilled manpower "offer many advantages for innumerable manufacturing and distribution operations."

Transportation facilities include the Ohio River and five railroads. It is in the heart of the Illinois oil basin and there is abundant coal and an unlimited water supply.

Some Progress — Earl H. Heseman, executive of the Chamber of Commerce, believes the Chrysler announcement has acted like a catalyst to the community. He believes the assets will be hard to beat as an incentive for new industries.

There is evidence that progress is being made in this direction. Aluminum Co. of America is completing an $80 million smelter 10 miles upriver from Evansville. A number of industries are expanding. Some smaller new plants are being constructed.

Mr. Heseman points out that Chrysler hasn't definitely decided to leave Evansville entirely. The company has a study team exploring the possibility of using at least part of the Evansville facilities for parts manufacturing.

"We have a year and a half to get ready for the change," he said.

Export Tips for Small Business

They Can Be a Hedge Against Slowdowns

The export market is not easy for a small business to reach, but it can be done. And the effort is worthwhile.

Here are some tips on how to establish contacts, and how to avoid some of the pitfalls.—By Rodolphe Huart.*

▪ Can relatively small companies take advantage of the fast growing export market?

U. S. exports in the first three quarters of 1957 were at an annual rate of close to $20 billion. Actual business done by U. S. firms through foreign subsidiaries and branches might well bring the total to more than double that amount.

Hedge Against Declines — Exports can become a desirable hedge against slowdowns in the domestic market. For many companies, the export business already results in the difference between being in the black or the red.

A sector of industry which should be particularly interested in exploring the international markets are the metalworking and metal producing companies, particularly the relatively small firms manufacturing a superior quality and design.

How to Export—How to go about entering the export field is a problem to companies without experience in international trade.

To eliminate guesswork, one should make use of international market research. The best sources for market study are the U. S. Dept. of Commerce, Chambers of Commerce here and abroad, international departments of banks, and trade development bureaus of U. S. shipping lines. Vitally important are private publications containing international commercial information.

Right Product Can Sell—Statistics regarding past or current exports should be examined. Not always do they give a true picture as to possibilities to penetrate a new market. Under normal conditions, a quality product presented at the right time to the right party probably can be sold.

As most small manufacturers are not able or willing to assume the expense of setting up their own export department to finance foreign sales, they have recourse to a combination export management house.

Obstacles Listed—What are the obstacles to foreign trade?

Financing of foreign sales, terms, and collections abroad.

Numerous restrictions now in effect in foreign countries on imports and, in particular, the granting of dollar exchange.

U. S. government formalities with regulations and documents.

Selling Facts—These are some facts on selling terms:

In the great majority of cases, the commercial letter of credit is utilized to guarantee the payment of merchandise transactions abroad.

Because of their knowledge of shipping, foreign exchange, insurance, cargo clearance, inland transportation, warehousing and distribution, the foreign departments of certain banks have increased their participation in financing of these operations.

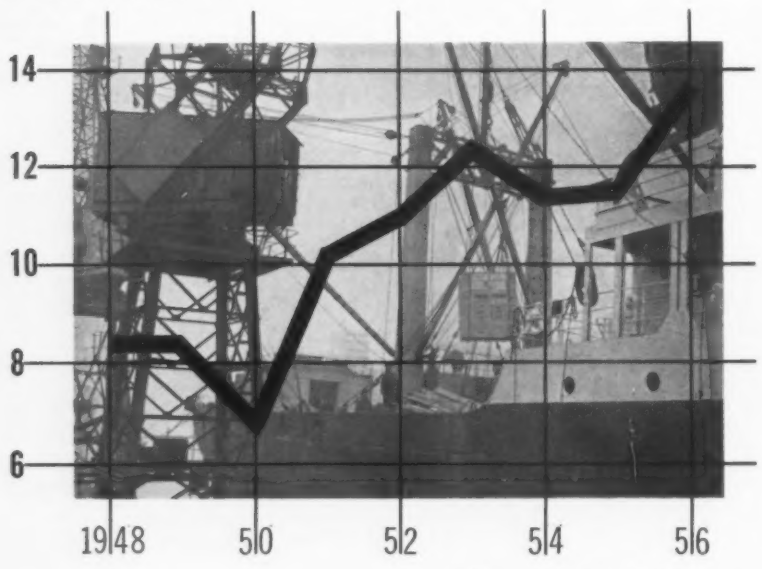
Quotations should be c. i. f. (cost, insurance and freight), f. o. b. (free

*Head of the Foreign Dept., Toledo Trust Co.

More Manufactured Goods Go Overseas

Exports of Semifinished and Finished Manufactures

In Billions of Dollars



Source: Dept. of Commerce

on board) or f. a. s. (free alongside ship), and include export packing charge.

Contract Terms—Basically, all merchandise financed by means of a commercial letter of credit should be covered by insurance, both marine and war risk. Depending on contract terms, insurance may be covered by either the buyer or seller.

Letters of credit may be drawn at sight or at 30, 60, or 90 days, or up to six months sight in some instances.

Letters of credit expire in the city in which the exporter or shipper is located. The expiration date is the final date on which drafts may be presented for negotiation.

Export Is Growing—The export potential is important. Experts in this field are predicting that virtually every country will buy more from us in 1958-60 than in previous years. Economic growth in the poorer nations of the world is creating a vast market in this field.

The European Common Market means a linking of the economies of France, West Germany, Italy, Belgium, the Netherlands, and Luxemburg.

Small Firm Problems—It will offer the large American firms boundless opportunities for private investments or licensing agreements. But what about the small firm?

As tariffs, export-import quotas, currency restriction now fence in each nation and make the interchange of their goods with those of their neighbors more difficult, small industry will need direct assistance as the burden of sending sales personnel abroad would be too heavy.

Plan Proposed — American authorities should realize that trade lists, sometimes several years old, are antiquated routes to establish a clientele for new products in overseas countries.

A program to train commercial specialists and to assign them to each American consulate might be advisable.

Gas Industry Plans Big Expansions

■ Just about everything happening in the gas industry these days is a new record. The result: The industry is spending more than ever for expansion.

The American Gas Assn. reports about $2 billion will be spent this year by utilities and pipeline operators. In the four-year period through 1960 they will spend about $8.7 billion. This also is a record.

In the four previous years, 1953 through 1956, the industry spent $5.3 billion. And in the four years before that the total was $4.7 billion.

Revenues Roll In—The gas men should have little trouble finding the money to pay for their ambitious plans. Revenues in 1957 hit a new high. The $4.014 billion taken in was 4.2 pct better than the previous high, in 1956.

The average number of gas utility customers in 1957 was 30.4 million. This is up 3 pct over the previous year. Total at the year's end was 30.9 million. Robert W. Otto, president of AGA, and chairman of the board of Laclede Gas Co., St. Louis, figures the industry will have about 33.5 million customers by 1960. And by 1965 Mr. Otto expects about 38.25 million people, plants and institutions to be buying gas.

Bigger Reserves—Both production and reserves followed the trend and hit new highs. Despite record output of 10.9 trillion cu ft in 1956, the latest year available, reserves actually were bigger at the beginning of 1957, due to new discoveries.

More Pipelines — The boost in business has resulted in more miles of pipeline and underground storage facilities. The American Gas Assn. figures that $54 million were spent on underground storage facilities in 1957, running the total invested for this purpose close to $500 million.

How U. S. Gas Industry Grows

(millions of dollars)	Revenues From Sale of Gas		
	Industrial and Commercial	Residential	Total
1948	$ 622	$ 958	$1580
1949	658	1031	1689
1950	771	1177	1948
1951	893	1335	2228
1952	1010	1457	2467
1953	1145	1574	2719
1954	1269	1783	3052
1955	1444	2008	3452
1956	1616	2237	3853
1957 (est)	1704	2310	4014

(Source: American Gas Assn.)

Powdered Metals: They've Been Around a Long Time

The idea of rolling metal strip from powdered metal is a comparatively new one. Yet it is an offshoot of pressed powder metallurgy—a technique at least 5000 years old.

In 3000 B. C., the Egyptians applied heat and mechanical pressure to pure iron oxide ore to get a metallic mass that could be forged into implements.

About 1600 years ago, the smiths of India made the famous Delhi pillar weighing 6½ tons from powdered iron.

The Incas were using a powder-sintering process for producing platinum long before Columbus discovered America.

Modern use of powder metallurgy to form intricately-shaped parts by pressing and sintering was suggested over a century ago by the German chemist, G. Osann, and the Englishman, W. H. Wollaston.

Until the past decade, objects made from powdered metal were limited in size to a few ounces. But latest developments in the strip rolling process indicate powder metallurgy may be on the threshold of a vast new era. Research is being stepped up.

Strip-From-Powder Makes Gains

There is a lot of activity in this field despite an air of quietness.

Copper strip may be the first metal mass-produced by the new rolling method.

▪ The lack of fanfare in the strip-rolled-from-metal-powder industry is misleading. A lot is happening behind the scenes—both in the laboratory and on the commercial front.

One firm is talking about building five plants to chemically reduce copper ore and copper scrap to powder then sinter-roll the powder into continuous copper strip. Each plant would cost an estimated $9.5 million.

Question of Financing — The process resembles "double pressing" of a powdered metal part. Powder drops from a hopper between rollers at an "angle of nip" of 7-8°. The strip is not rolled to full density, but passes through a sintering furnace at about 80 pct density.

Hydrometals, Inc., is the company talking about building five plants. There has been some question raised as to when the $50 million needed to finance construction would be available. Informed sources believe that the financing will not be left to Hydrometals alone; that at least two major copper companies will back the new plants with their own funds.

The Pioneers — S-K-C Research associates, one of the pioneers in testing of U. S.—adapted equipment for rolling powders to continuous sheet and strip, reported successful rollings of both ferrous and nonferrous metals last year.

Chemetals Corp., is the exclusive licensing company in the U. S. for both the powder producing and powder rolling processes.

Many Metals Adaptable—Nickel, copper, and brass powders have been rolled successfully into continuous strip. Such other alloys as nickel-cobalt, stainless steel, and tin bronzes have been successfully rolled on small laboratory equipment, and the physical characteristics of the end product indicate that other metals and alloys may also be reduced to powder and rolled into strip.

Despite the quiet on the copper front, there is ample evidence to suggest to copper producers that the process is worth keeping an eye on. Careful cost studies were run by E. W. Bliss, producer of the rolling mill equipment used in compacting the metal powder into sheet. Industry reports suggest these preliminary returns are encouraging; that strip from powdered copper may be poised for a breakthrough.

Prospect for Iron—Even ferrous metals producers are beginning to perk up their ears.

The steel companies in their search for additional sources of iron, are spending tremendous amounts of money on direct reduction processes.

At least two major research laboratories and a chemical firm are working on iron powder with an eye to its commercial rolling possibilities.

Mills Deemphasize Ingot Rate

Fairless Blames Misinterpretation of Weekly Projection

Emphasis will shift to tonnage output and more stable index of production.

Operations as a per cent of capacity will be based on previous week's production.

■ Worried by misinterpretations, the steel industry begins a major shift in emphasis in its statistical reporting on operations. Effective with its figures for this week beginning January 13, American Iron and Steel Institute will no longer release the weekly projected steel operating rate as a percentage of capacity.

Instead, AISI will release projected production in tons and the projected index of production, as it has been doing for some time. And it will release the previous week's actual operations as a per cent of capacity.

Fairless Says — "The fallacy," said Benjamin F. Fairless, president, AISI, "of using the weekly percentage operating rate as an economic indicator has been intensified in recent years by the very substantial expansion in steel making capacity which has taken place."

The Institute also announced a new annual capacity figure of 140,742,570 net ingot tons as of Jan. 1, 1958, representing an increase of 7.3 million tons since the first of last year. This latest estimate of steelmaking capacity is about 23.7 million tons above the steel industry's greatest annual steel production of 117 million tons during 1955. "With such a large amount of capacity ready now to meet the needs of the future, a weekly steel operating rate based thereon has more limitations than ever as an economic yardstick," he said.

Questioned directly at the press conference where the announcement was made, Mr. Fairless said:

"It is not the policy, nor the recommendation of AISI that any information now being given to the press shall be discontinued. Of course our members make their own decisions, but we have no thought to camouflage the operating conditions of the steel industry."

What IRON AGE Reports— The IRON AGE will therefore continue to report projected and actual district operating rates as a per cent of capacity. It will use AISI's aggregate operating rate covering the previous week.

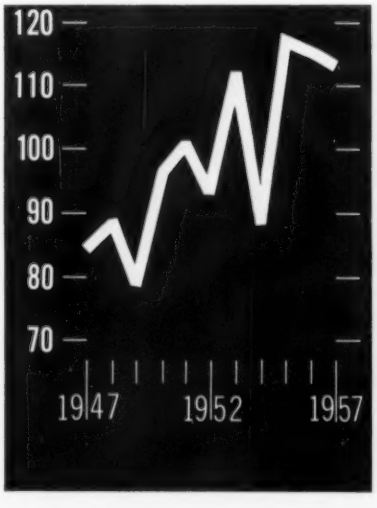
A far greater tonnage of steel can be made today at a given per cent of capacity than at the same operating rate a few years ago. For example, an operating rate of 80 pct for the year 1958 would yield about 112.6 million tons of steel or nearly 5.8 million tons more than would have been produced at 80 pct operations during 1957. It would yield over 37.2 million tons more steel than could have been made at 80 pct of capacity 10 years ago.

To provide a cushion of capacity to be available in the event of national emergency and to provide in advance for the forecast growth in population and expanding demands for steel in our economy, steel companies have added 46.5 million tons of steel capacity in the past 10 years. The increase in capacity, being geared to long-term future requirements, could outstrip current production in a particular year.

How Ingot Rate Distorts Steel Output

Production Trends Up . . .

(Millions of Ingot Tons)



But Ingot Rate Trends Down

Ingot Rate

Air Force Looks at Beryllium

Will Test Sheets for Aircraft and Missile Work

Beryllium's light weight and strength at high temperatures have intrigued aircraft makers for a long time.

Now Brush Beryllium has been given order from Air Force to roll large sheets of it for a two-year study.—By T. M. Rohan.

▪ The U. S. Air Force is now zeroing in on more use of beryllium in aircraft and missiles.

Although long coveted by aircraft designers for its light weight and strength at high temperatures, it has previously stayed largely a possibility although popular as an alloying material for copper and in atomic work.

But serious consideration is now being given it by the Air Force as well as by the Defense Dept. Brush Beryllium Co. of Cleveland, a pioneer and leader in the field, is now starting to roll the largest beryllium sheets known under a $330,000 Air Force development contract. These will be shipped over a two-year period to the Air Force for evaluation and testing for aircraft and missiles work.

Even more significant is that resultant development of the technology of rolling the wide sheets would pave the way for large scale production.

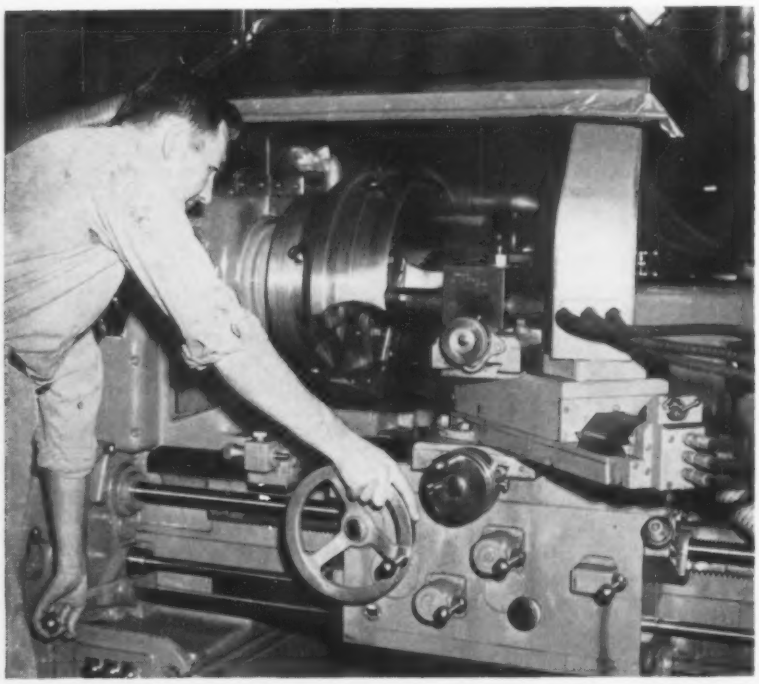
Instrument Use Planned—Some future airplanes still on the drawing board are based on partial use of beryllium. Its most immediate possibility in the field is for the complex machined parts of instruments and as containers for delicate electronic equipment. Long term possibilities are for use in skin and control surfaces and extruded structural members of aircraft and missiles.

"We feel beryllium will find a definite use in the aircraft and missiles field because of its unique characteristics," says N. W. Bass, Brush's sales vice president. "Designers can obtain the same stiffness at about 1/6 the weight of steels used today.

Machinability Helps—"Depending upon the applications, it may be considered for use at temperatures in the 1300° to 1500°F range and this may be boosted even higher as development progresses. Although the base ingot price is high at about $50 per lb, on a finished piece basis it can compete favorably on some applications with other materials. This is because of the easier machining (comparable to cast iron), and the light weight involved. And we definitely feel the price of fabricated products will be decreased by perhaps 50 pct in the next three to five years. This will come about as demand increases and higher mechanization becomes feasible."

Unprecedented rolling of the large sheets will be done at Brush's new $4.5 million plant at Elmore, O. which can turn out five tons or more per month of vacuum-cast ingots. Fabricated products already turned out at Brush's Cleveland plant are rod, slabs, seamless tubing and machined parts. Some machining has been done for years by chemical milling in small lots. This technique is ready for scale-up into production use as required.

Hot Working Needed — "The major difference between rolling beryllium and steel at present is



SKY TRIP CANDIDATE: Machinability of beryllium—here being cut at high speed in Cleveland plant of Beryllium Co.—is one of the properties that make it attractive to aircraft and missile manufacturers.

that beryllium must be rolled at elevated temperatures (900° to 1600°F) while steel can be cold rolled," according to Keith Wikle, project engineer.

Conventional steel equipment could be used if adapted for the hot rolling. Brush will use a Mesta 2-high mill with 30 in. wide, 20 in. diam rolls, originally used as a hot breakdown mill for beryllium-copper strip.

In addition to sheet, the Dept. of Defense expects to expand into extrusion, forging and casting of beryllium. The sheet will be rolled from pressed powder slabs and be 5 ft long. Widths will be 12-18 in., 18-24 in. and 24-30 in. Thickness will be 0.020-0.040 and 0.060 in. About 160 sheets will be turned out. Brush currently is rolling beryllium sheets in smaller lengths to 24 in. wide.

Impressive Properties — Beryllium has intrigued aircraft and missiles designers for years because it is about three times stronger than present aircraft steels on a strength-weight ratio. It weighs two-thirds as much as aluminum and can be considered for use at 1000° to 1500°F of the temperatures anticipated in future designs. It also has four times the modulus of elasticity of aluminum.

A theoretical all-beryllium fighter Mach 2.5 speed would weigh 8 tons less than one of steel, could go 8 pct higher and 16 pct farther. In a transport plane, beryllium would cut the weight of structural members 50 pct under aluminum alloy. In addition it has high electrical and thermal conductivity so heat can be dissipated and it is easily machined.

But Some Drawbacks — Chief among its drawbacks are low ductility, price, and practical control of possible toxic effects on sensitive individuals. Thus the plane and missile of the future probably will continue to be a combination of the best metals for specific jobs. Present low ductility of beryllium hampers its use in structural or engine parts.

Budget Points Up Missile Era

It looks like most of Ike's budget recommendations will get approval from Congress.

Missiles are the big factor in defense. Budget can be balanced.—By G. H. Baker.

▪ President Eisenhower's new $74 billion budget is meeting a favorable reception in Congress. Bipartisan support is shaping up for the record-breaking sums now scheduled for spending in the fiscal year that starts July 1.

Leaders in both political parties predict Mr. Eisenhower will get all the dollars he is asking to supply the nation's missile-age demands.

Military Up $1 Billion — Total military spending is calculated by Mr. Eisenhower at $39.7 billion—up by nearly $1 billion from this year's $38.8 billion.

The military emphasis in the new budget is overwhelmingly on missiles. Mr. Eisenhower wants $5.3 billion for missile programs. Most of this sum is to come from new appropriations.

To get an idea of how missile procurement is to mushroom in the months ahead, compare this $5.3 billion being asked with the $4.3 billion being spent this year and the much-smaller $3 billion spent the year before.

But conventional armament and equipment must continue to play an important—although somewhat smaller—role in national defense, Mr. Eisenhower warns. Despite advances in space travel, atomic weapons, and intercontinental missiles, the Pentagon still is ordering sizeable quantities of propellor-driven aircraft, rifles and small-arms ammunition, and land vehicles of many types.

Key Points—Here, at a glance, are the five key points in Mr. Eisenhower's new budget:

1. Military spending authority is to rise immediately (between now and June 30) by $1.3 billion, and again by $2.5 billion in the year beginning July 1. Emphasis is on missiles, atomic weapons, and research on advanced projects.

2. Military spending, as a result, will rise by $2.8 billion (over 1957 totals) for missiles, nuclear-powered or nuclear-armed ships, science, and education. In addition, the White House wants a special reserve fund of half a billion dollars to be spent at its discretion as required by new break-throughs in weapons technology.

3. Spending for conventional weapons and equipment is to drop by $1.5 billion in favor of new weapons.

4. Curtailment of nonmilitary Federal programs by "several billions" over the next several years is recommended.

5. No tax cuts.

Can Be Balanced — Mr. Eisenhower tells Congress that a balanced budget will result if all his recommendations are followed.

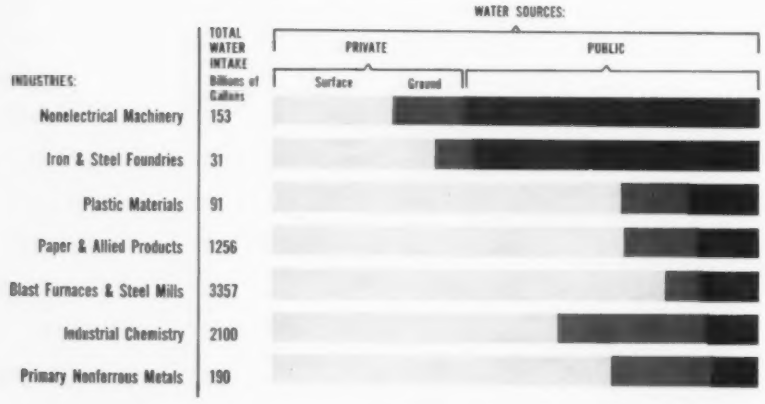
But, the budget as finally approved is likely to emerge a good deal plumper than it is now. If this happens, the Administration will have to contend with an unbalanced budget and deficit financing.

Tax Outlook—Tax-wise, the picture for the year ahead is not bright. Mr. Eisenhower asks that the scheduled reduction (June) in the 52 pct rate applying to income of corporations be postponed, as well as the scheduled reductions in some Federal excises.

Stockpiling of metals and minerals is to decline still further.

How Water Affects Plant Location

Where Industry Gets Its Water Supply



Source: Battelle Memorial Institute

Battelle report cautions that water supplies must be evaluated as a local problem.

If an area has other assets, it may pay a company to install systems to cut water use.

▪ Finding adequate water supplies is an increasingly important problem for industry.

Nationally, municipal water needs are expected to increase 67 pct and industrial water needs will double in the next 25 years. But a recent report by Battelle Memorial Institute stresses the fact that water supply is a local problem and can't be evaluated by national trends.

Keep In Perspective — "To do an effective job of industrial development—whether attracting new plants or fostering the growth of existing plants—it is imperative that industrial development groups see water supply in its proper perspective," the report states. It is authored by Thomas Best and Robert Smith of the Battelle staff.

Water is, of course, a top requirement in industrial plant location. But if a community is short of water, but has other attractions, plants can justify installing elaborate recirculation and other systems to cut water consumption.

Use Can Be Cut—An example contrasts the use of 65,000 gal. of water per ton of steel by one Ohio steel mill with 2000 gallons per ton in one Pacific Northwest mill.

The Kaiser Steel Co. at Fontana, Calif., had to be located 45 mi inland for defense reasons and was designed so that net water requirements are 3450 gal. per ton. U. S. Steel's Geneva Works in Utah was engineered down to 1400 gal. per ton.

Recirculation Used—Most widely used methods of cutting water consumption are recirculation and air cooling using a closed cycle heat exchanger. Metalworking plants generally use relatively small amounts of water, mostly for sanitary and service purposes. Ground water supplies are generally sufficient.

High value added by manufacture in these plants tends to reduce relative importance of expenditure for water.

Rivers and streams still continue to attract plants, since surface water comprises two-thirds of all industrial sources. Another one-eighth comes from private ground sources. Remainder comes from municipal supplies.

Quality Important — Quality of water is a stumbling block to many firms, although treatment can remedy most situations. But for some plants it is the determining factor in new plant location. About 30 pct of all plants are treating their water.

Some problems are corrosion from high chloride concentration, staining, abrasion from foreign material, deposition of scale, foaming and organic growths.

The Battelle report is optimistic on chances of municipalities with either abundance or shortage of water attracting new industries.

"Realistic appraisals of the industrial water picture need seldom discourage sincere, objective area development groups," the report states.

"Few regional or state groups would be unable to attract some kind of industries somewhere within their territories if they have other assets attractive to industrial development."

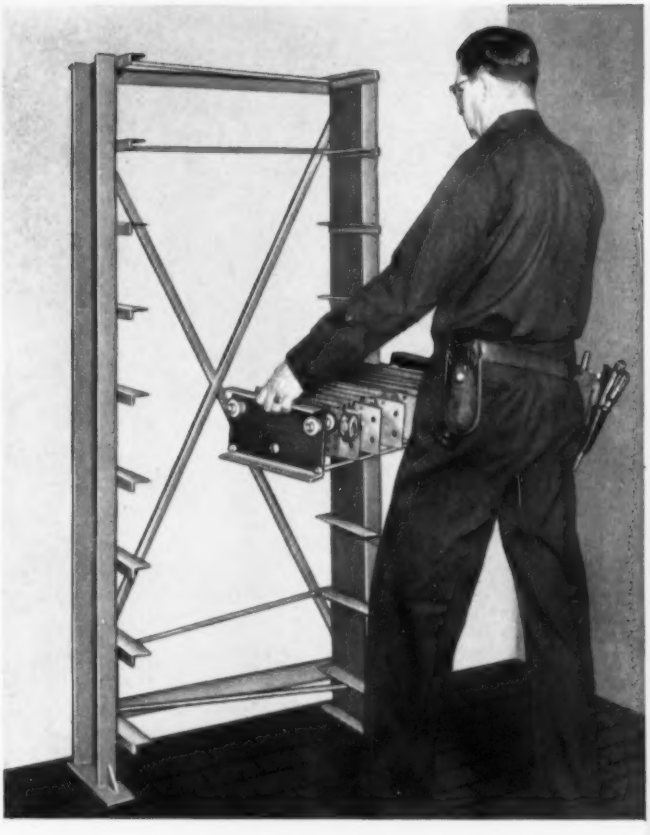
"As sites in areas currently regarded as premium are absorbed by industrial and commercial growth, water advantages of areas with some handicaps may increase their desirability."

Three New Mills

The site for three new primary rolling mills at U. S. Steel Corp's Duquesne, Pa., works is now being prepared.

The new mills will be housed in five new buildings. The project is scheduled for completion in 1959.

To be installed are a high-lift, blooming-slabbing mill with work rolls 46-in. diam; blooming mill with 36-in. rolls; and a billet mill with 21-in. rolls. Also in the project are new ingot stripping facilities.



NEW EC&M UNI-STACK

Self-Standing

Industry's First RESISTOR MOUNT

EC&M's new **UNI-STACK** means significant savings because it's self-standing, and can be mounted in position before resistor sections are installed. **UNI-STACK**'s lighter weight makes it easier to handle, quicker to install. Individual sections then can be slipped into place easily.

Only two front bolts are required to hold individual **TAB-WELD*** resistor sections in place. Resistor terminals are located at the front for quick connection to either cable or bus. **UNI-STACKS** are available in seven sizes for mounting from three to nine EC&M **TAB-WELD** standard mill sections.

*Registered Trade Mark of EC&M

NOW...
up to 500 Amperes Continuous

• EC&M **TAB-WELD** resistor sections are now available in capacities from 13 to 500 amperes continuous rating. Sections are mill-type with the same grid size throughout and supplied with clamp terminals. EC&M **TAB-WELD** construction eliminates burning at the grid-eyes and at tap-plates.

For convenience, space savings, and lower costs, specify the perfect combination—EC&M TAB-WELD Resistors and EC&M UNI-STACKS

THE ELECTRIC CONTROLLER & MFG. CO.
A DIVISION OF THE SQUARE D COMPANY
CLEVELAND 28 • OHIO

9696

Steel Strike Likely Next Year

▪ Tom Campbell, editor-in-chief, The IRON AGE, predicts heavy labor demands, rugged negotiations —and a strike in steel in 1959.

Writing in "The Exchange", official magazine of the New York Stock Exchange, Mr. Campbell says:

"Labor will be setting the stage early next year for a big deal with steel. The zero hour will be sometime in June, 1959. From this faraway point it looks this way: Heavy demands, rugged negotiations, a personal prestige battle by Dave McDonald, a 'last stand' for steel officials — all leading to a strike.

The Pattern—"The strike will be followed by the usual: Wage increase and price increase — just when the government will be trying, ineffectually, to stem the tide of inflation."

On the outlook for steel in '58, Mr. Campbell is not pessimistic despite the expected fall-off from 1957 levels, but neither does he view the next 12 months with rose-tinted glasses. He predicts a temporary return to "normalcy" but adds that "steel output won't be too bad, and earnings for the year won't make tearful reading."

"These predictions could be too conservative if defense spending gets out of bounds within a few months and if the Administration runs scared about a depression.

Like 1954 — "Second thoughts indicate that it would take three to six months for either of such factors to 'take hold.' Hence the steel industry will follow a pattern not too far removed from 1954— except that tonnage output will not take such a beating."

Mr. Campbell predicts a slight improvement in sheet and strip business in March, May, and part of June with a summer slump after that.

"This 'normal' summer slump will be followed by a pickup in all steel business by the fourth quarter. It will be paced by the 'smart' fellows who will see what is coming up ahead. It is they who will set off a big buying spree which will start rolling early in 1959—a bull market which will cause temporary shortages."

Upturn By October—In a speech before the Seattle Chamber of Commerce and the Pacific Northwest Steel Fabricators' Assn., Mr. Campbell forecast an upturn in metalworking business by mid-year.

"By October," he said, "we will be on our way to another boom phase in the economy."

The IRON AGE editor predicted a steel price increase of $5 to $7 per ton this year as a result of higher wages to steel workers. "Steel people are over the barrel on labor costs and can't do anything about it due to the three-year contract," Mr. Campbell said.

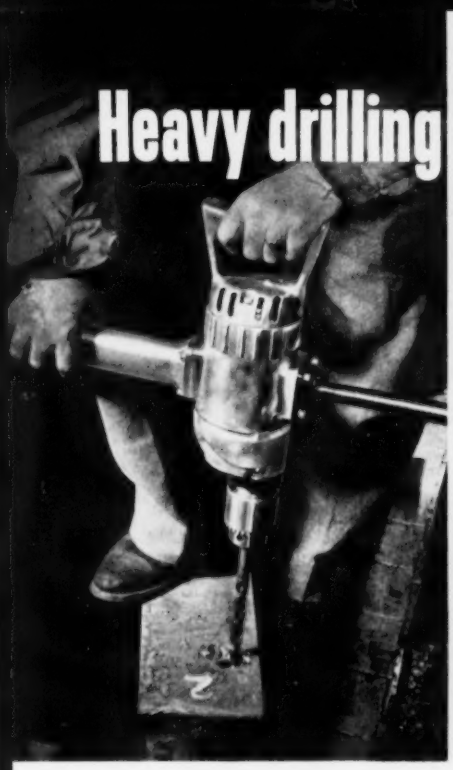
Welding Important in Making New Clad Pipe

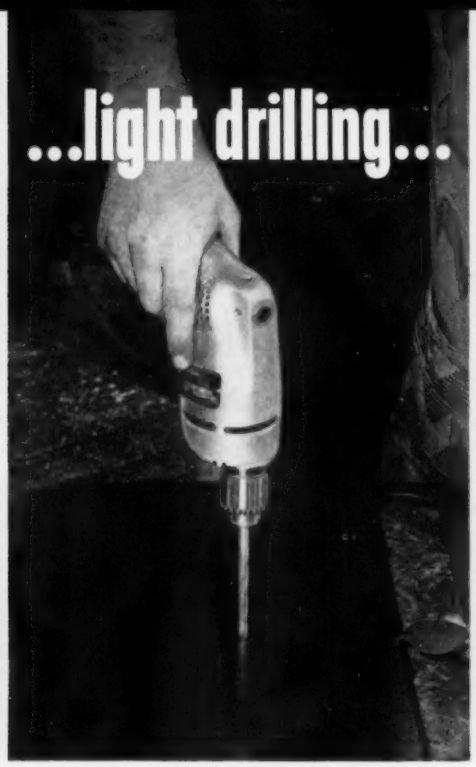
STAINLESS-CARBON BOND: New, corrosion-resistant pipe of bonded clad is tested. Welding techniques developed by Lukens Steel Co. had major role in producing the product in diameters as small as 4 in. Expected to be valuable in chemical and nuclear applications, the pipe is designed to give stainless benefits below solid stainless costs.

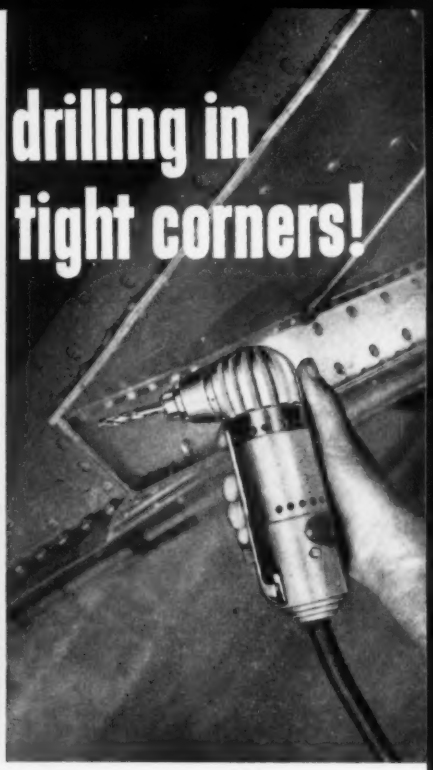
Record Steel Payroll

The basic iron and steel industry had a record payroll for the first 11 months of 1957, reports the American Iron and Steel Institute. The industry wrote paychecks to the tune of $3703.8 million.

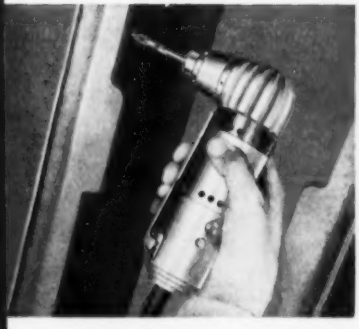
Through November, 1956, the payroll was $3445.7 million.



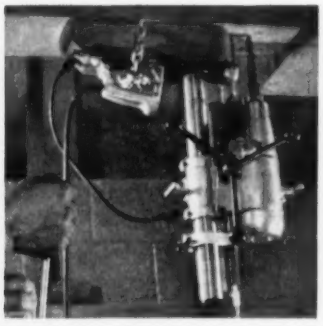




There's a Black & Decker Drill powered for every job!



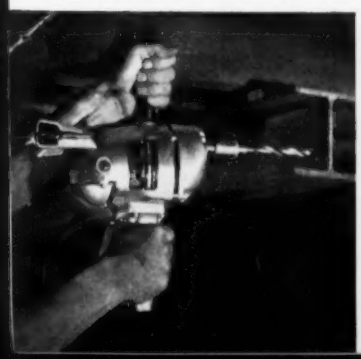
LITTLE SHORTY'S the drill you want for those hard-to-get-to, around-corner jobs. Gets in tight spots! Excellent for small unit assembly.

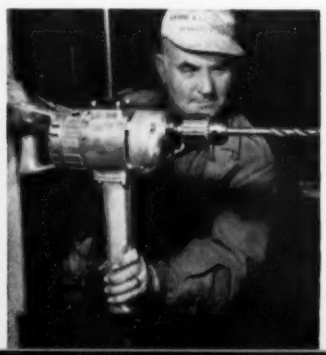


DRILLS UPSIDE DOWN! B&D Magnetic Drill Press sticks to the wall like a fly; operates manually or with exclusive remote control.

TREMENDOUS TORQUE for the tough jobs. 3/8" Heavy-Duty Drill is geared and powered to take on the hard ones. Compact to work in close quarters.

MOST POWERFUL drill of its size available, the 3/4" Standard! A rugged tool with plenty of zip in reserve. Fully reversible; positive drive clutch.





71% of purchasing agents say make mine Black & Decker!

A recent industrial publishing company survey reveals that when purchasing agents need electric tools most think first of Black & Decker! One reason why: 33 *different* drills each designed to give you the power you need *plus* easy handling and long, troublefree life!

If you have a drill problem, be sure to look to Black & Decker. See us at the *Plant Maintenance Show* or better yet, mail the coupon below for a free demonstration. THE BLACK & DECKER MFG. CO., Dept. 0901, Towson 4, Maryland (In Canada: P. O. Box 278, Brockville, Ontario).

Look Under "TOOLS-ELECTRIC" in Yellow Pages!

Leading Distributors Everywhere Sell

B&D Black & Decker®

Quality Electric Tools . . . Power-built for top performance

MAIL COUPON FOR FREE DEMONSTRATION

THE BLACK & DECKER MFG. CO., Dept. 0901, Towson 4, Md.

☐ Please arrange for a demonstration of the following drill(s) .....

☐ Please send me additional information.

Name..... Title .....

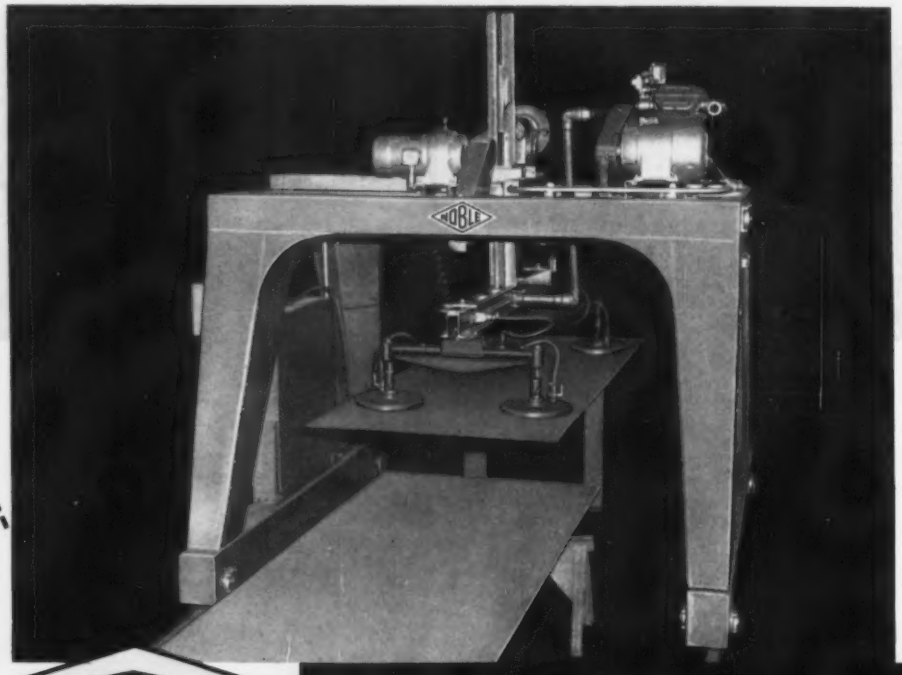
Company.....

Address.....

City..... Zone..... State .....

PROCESSING PLATE?

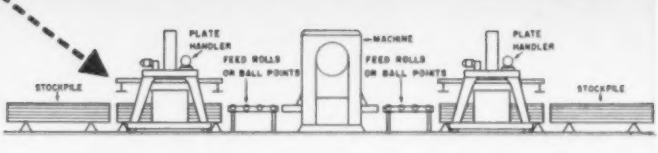
Get the production you're paying for



WITH A

NOBLE *Automatic*

PLATE HANDLING SYSTEM



NOBLE Automatic Plate Handling Systems eliminate the costly, often hazardous manual handling required in processing plate and sheet.

NOBLE handlers automatically pick up from a pile or conveyor, transport and deliver plate or sheet stock to the machine, pick up worked pieces from the machine and deliver them to piles or conveyors. Increase your profits by:

1. Reduced handling costs — no handling crews required, no prolonged crane tie-ups.

2. Better machine utilization — NOBLE automatics deliver and remove plate as fast as the machine can operate. There's no idle standby while operators wrestle a plate into position.

3. Increased production — NOBLE users report gains of 20% or more, depending on conditions, as the result of faster handling and reduced idle machine time.

THREE TYPES AVAILABLE

Standard NOBLE automatic plate handling systems are available in floor-mounted rail, overhead rail and radial transfer types. Standard capacities are 1,000, 2,000, 3,000 and 4,000 lbs. Higher capacities and special designs for specialized applications.

NEW BROCHURE AVAILABLE . . . describes economics of automatic plate handling, proper applications, typical system layouts, and all NOBLE equipment required. Write for your free copy today; please address Dept. I-1.

3

NOBLE COMPANY

P. O. Box 1979 • Oakland 4, California

Dr. Maurice J. Day

Stepping Up the Research Pace

While others talk about the lag in science, Crucible's Dr. Day is busy doing.

In less than three years he has helped develop an outstanding research and development team.

■ While the skeptics, the semi-informed, and the wishful thinkers are voicing opinions on who's ahead in technology, the U. S. or Russia, Dr. Maurice J. Day waves aside the comparison.

No matter what alarmists say to the contrary, Dr. Day, vice president of research and development, Crucible Steel Co. of America, feels that U. S. technology is not lagging behind the U.S.S.R. Comparisons of the two, he says, are fundamentally inequitable for a number of reasons.

No Competition — In Russia there is uniform acceptance of a product. A particular grade of steel, for instance, is accepted by the consumer without criticism. State owned steel mills aren't worried about competition.

There are no labor problems to speak of, no wage increase battles, no strikes. In the U. S., steel companies must take all these things in stride while striving to improve products and buck competition.

Hard at Work — Despite this, says Dr. Day, in the U. S. we continue to set new records in steel utilization — even when business isn't particularly good. This is because of continually expanding capacity.

And while debates over who's ahead rage on, Dr. Day and his staff at Crucible are unceremoniously improving on steel technology. Their primary job is "to meet customer specifications and to develop new steels that will better service customer needs." In so doing they are contributing to the nation's technological leadership.

MAURICE J. DAY: U. S. technology is not lagging.

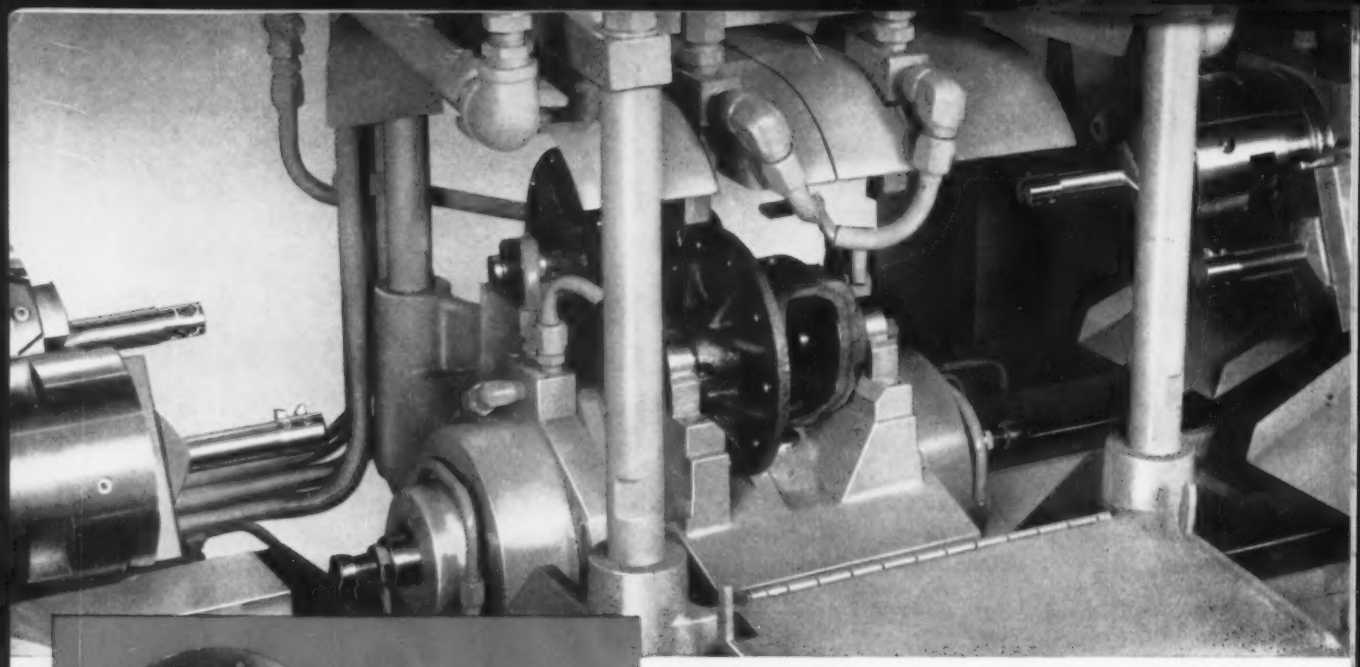
A Scientist Develops—When Dr. Day came to Crucible from Armour Research Foundation in 1954, the company had a research staff of about five people. Today it consists of more than 100 top-flight metallurgists and scientists.

At Armour he had picked up valuable training in running a research organization as manager, materials and processes division, and as assistant director of the Foundation. Prior to that he had 15 solid years of metallurgical experience with U. S. Steel Corp. and Carnegie-Illinois Steel Corp.

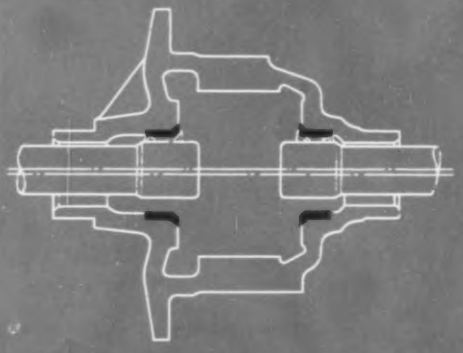
Prolific Author — Born and reared in Saginaw, Mich., 45-year-old Dr. Day was graduated from Michigan State College. He is one of a handful of American engineers to receive the special Centennial Citation and Award from his alma mater.

He has authored more than 15 technical papers on making, shaping, and treating of steel.

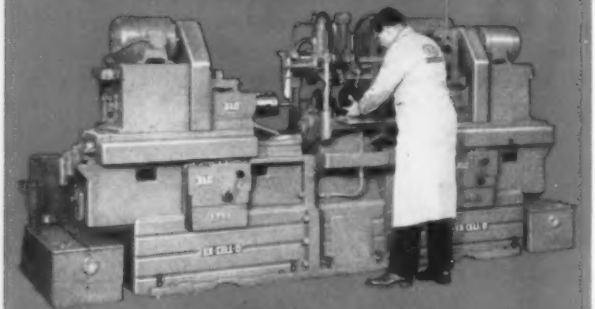
Lending authority to his views on military technology are his membership on the panel of guided missiles, National Academy of Sciences, and participation in the Naval War College annual global strategy discussions.



Above, close-up of parts in fixture. Overhead air clamps in position for loading and unloading. Part shown at left.



Internal boring and chamfering cuts indicated by black lines. Tolerances are held to ± .0005".



Ex-Cell-O Two-Way Precision Boring Machine ups production, increases accuracy.

XLO EX-CELL-O FOR PRECISION

Increases Production, Keeps Accuracy

Back-bores and Chamfers Differential Cases

If you want to increase production, yet maintain .0005" accuracy, get an Ex-Cell-O Two-Way Precision Boring Machine. That's the opinion of an automobile manufacturer.

Right now this machine is performing back-boring and chamfering operations inside steel automotive differential cases for this company. Boring bars enter the case on the center line of the bores, then move 5/32" off center, perform the cutting operations, then withdraw after returning to the center line. Two cases are machined at the same time.

Ex-Cell-O Way Machines perform as one, two, three, and four-way assemblies with exceptional versatility.

These machines adapt smoothly into automated lines, too. See your Ex-Cell-O representative or write Ex-Cell-O, Detroit.

EX-CELL-O CORPORATION
DETROIT 32, MICHIGAN
Machinery Division

MANUFACTURERS OF PRECISION MACHINE TOOLS • GRINDING AND BORING SPINDLES • CUTTING TOOLS • RAILROAD PINS AND BUSHINGS • DRILL JIG BUSHINGS AIRCRAFT AND MISCELLANEOUS PRODUCTION PARTS • DAIRY EQUIPMENT

57-24

Can You Economize, Efficiently?

You will be under terrific pressure this year to keep your expenses down and efficiency up.

There's more to economizing than swinging the axe. But it's tough knowing where to draw the line.

▪ The middle management group of a large, and highly prosperous, automotive division is still grousing.

Traditionally, they receive handsome Christmas gifts from the division. But this past Yuletide brought them nothing but the corporate Christmas message of good cheer.

An Indication—However, it isn't the lack of a Christmas gift that worries them. They wonder if it is an indication of what to expect when the annual bonus is handed out. They hope for the best, but they recall that even last year's was less than the year before.

This is an illustration of what's going on throughout industry today. The economy axe is really swinging. Frills and non-essentials will be virtually impossible to get through the budget. There is a strong tendency to cut down departments that aren't strictly productive, with a tangible product and profit to show.

What's Coming—Here are a few things to expect: Executive bonuses will be cut; expense accounts will be tighter; fewer of your men will be sent to conventions and meetings; less will be budgeted for entertainment and promotion; to name some of the most obvious.

In your own business, division, or department, you will have to draw a fine line between cutting out the frills and cutting into vital functions. You can't afford to carry dead weight and authorize spending that isn't justified.

Measure of Success—But, at the same time, there is still a shortage of good men and talent. Good will, with customers and employees, is not something that you can afford to neglect, even in a period of business recession.

One measure of your success this year will be how you handled the change from boom to decline, without sacrificing efficiency, morale, and company reputation.

The Trouble With Missiles—

Facts of Life—A fact of life of the missile program is: One of its most immediate effects will be aggravating problems that already plague business.

A case in point is the situation at Chrysler Corp., where 4000 employees will be added to the missile-making work force. This is on the strength of the contract to manufacture the Jupiter. (Chrysler is already making the Redstone at a Detroit area plant.)

Not Much Help—But the hiring of 4000 missile personnel is scant good news to the Detroit labor market, where thousands of autoworkers have been laid off in recent weeks.

About 25 pct of those hired will be qualified engineers, 40 pct technicians, and the rest hourly rated and salary jobs. Many of the last group will be highly skilled workers.

Growing Pains—Although recent aircraft cutbacks have put a lot of engineers in the job hunting class, there is no real easing in the engineering shortage. The missile program will only aggravate this shortage, while doing little to ease the growing unemployment.

It's expected that the billions of dollars soon to be lavished on missiles will have a secondary effect in sending the economy back to record heights. But there are difficult times ahead before maturity.

Orders Drop 20 Pct

Little to Cheer—In spite of reassurances of an end of the business downslide in the second half, the short term situation is not encouraging.

New orders in the durable goods industries are running about $3 billion a month under last year. This is probably a full 20 pct less than the rate a year ago.

This is only an estimate, but probably a pretty close one. Certainly business is no better than November, the last month for which statistics are available.

May Go Lower—New orders in all manufacturing in November totaled $26.1 billion, compared with $29.4 billion in November, 1956. The durable goods industries' new orders dropped from $15.1 billion to $12.3 billion.

The rate this month is probably even lower. The auto industry, for example, has dropped off considerably since the November rate, indicating an even less encouraging situation today.

Ford Enters Heavy Truck Arena

New Gasoline-Powered Line Figures to Be a Contender

Ford Div. is placing its hopes on increasing demand for heavy-duty trucks.

The Federal road program and continued industrial expansion are factors.—By H. R. Neal.

▪ Ford Div., the nation's No. 2 truck manufacturer, is unleashing a campaign that it hopes will carry the division to the top spot in the business. "Power" is the new Ford product.

The division is entering the heavy duty truck market with a line "fully competitive with the biggest gasoline-powered trucks made." The announcement was made at Ford's Louisville truck plant by J. O. Wright, Ford Motor Co. vice president and Ford Div. general manager.

Payload Claims—Included in the new line are heavy duty tilt cab, conventional and tandem models. They range in size from 25,000 to 51,000 lb gross vehicle weight and 50,000 to 75,000 lb gross combined weight. GVW is the weight of truck and its equipment. GCW includes the cargo.

Some models of the big line feature up to 20 pct greater payload capacity than the biggest trucks previously made by Ford. One model has been tested at weights considerably above its 75,000 GCW rating with "very satisfactory results."

NEWCOMER: Biggest of the big new line of Ford heavy-duty trucks is the T-950, a tandem-axle, transit-mix unit with a 51,000-lb gross vehicle weight rating. The new line was introduced by Ford dealers this week.

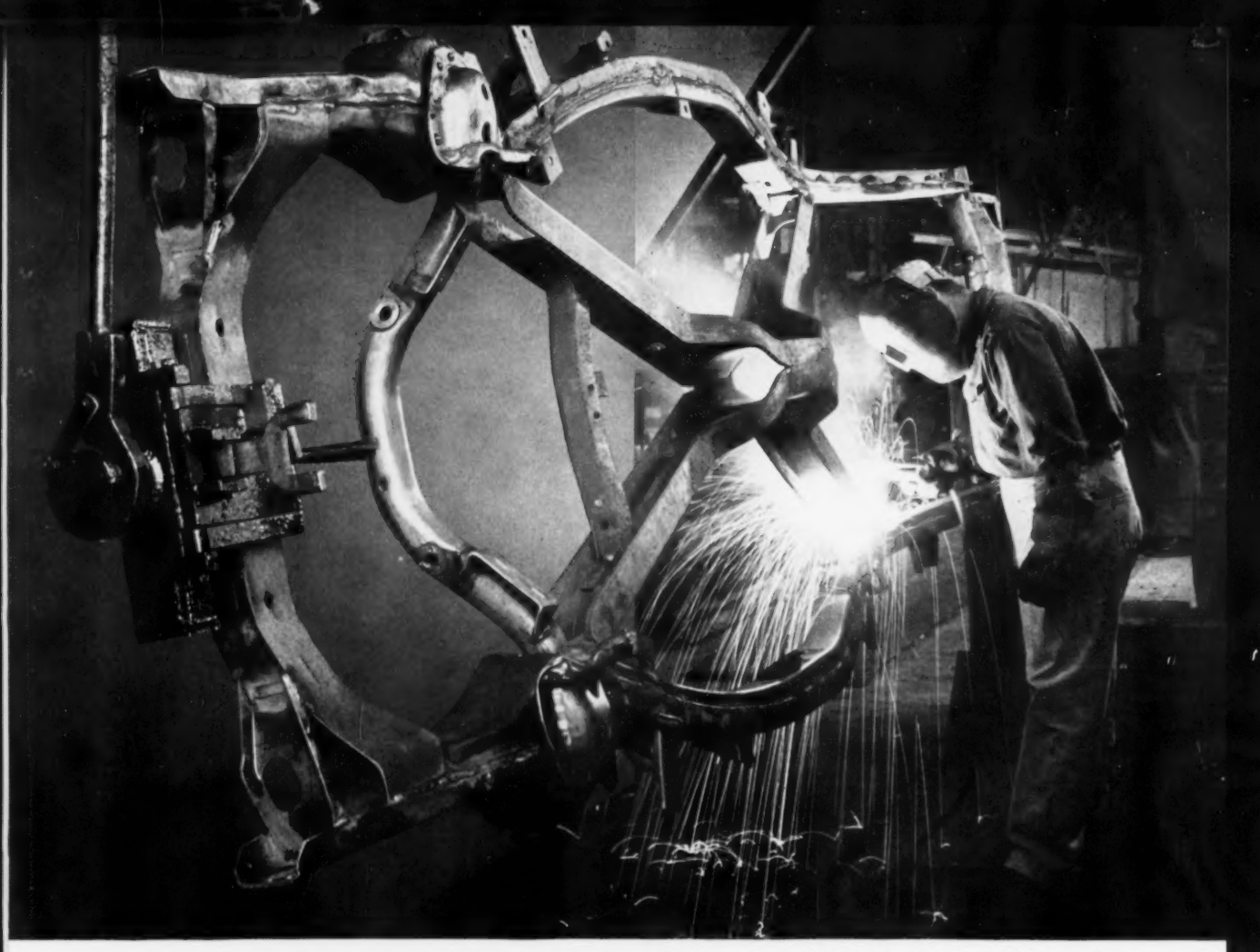
Market Is Growing—Demand for greater payload by truckers is one of the reasons that prompted Ford to get into the big truck market. The firm's market research experts estimate a demand for some 60,000 heavy duty trucks in 1958. This is triple the 21,000 registrations in this category in 1950.

Ford is banking on the nation's highway construction and industrial expansion programs to increase the country's demand for more and bigger trucks. It is sure that completion of the highway program is going to cause a boom in long-distance highway hauling. And big rigs, with larger payloads, will do the hauling. The company intends to supply the trucks—or at least a big share of them.

The Gap Narrows — Aggressive work now and planning for the future seems to be paying off for Ford. In the past year the industry's truck output dropped 12,000 units under 1956's total of 1,107,000. Ford, on the other hand, boosted its production by 40,000 units from 297,000 trucks in 1956 to 337,000 trucks in 1957. It was one of four major truck makers to show an increase for the year.

At the same time, Ford closed the production gap between itself and Chevrolet, the industry leader, to 14,500 units. At the end of 1956 Ford trailed Chevrolet by some 56,000 units.

A Giant Enters—Ford's entry into the heavy duty truck field is also significant for another reason. Aside from some activity by General Motors' GMC Truck & Coach Div., Ford is the first of the automotive Big Three to enter this area of gasoline-powered truck manufac-



At this point an automobile frame is near completion. The X-member is being welded.

FRAMES LIKE THIS DEMAND A STRONG STEEL

Automobile frames, like so many products, are only as strong as the steel that goes into them. Automotive manufacturers and other customers have long relied on Great Lakes steel for strength and dependability.

Great Lakes quality-controlled steel provides a safe margin of strength, assuring customers satisfaction in this respect.

Uniformity and ductility are other important characteristics of Great Lakes steel. All combine to bring to you dependable performance during fabrication and in the end product.

When you get Great Lakes steel you get steel that fits your specifications, delivered on time. For the full story of Great Lakes quality-controlled steel, make it a point to call your Great Lakes Steel representative soon. He's as near to you as your telephone.

GREAT LAKES STEEL CORPORATION

Detroit 29, Michigan • Division of

NATIONAL STEEL CORPORATION

District Sales Offices: Boston, Chicago, Cincinnati, Cleveland, Grand Rapids, Houston, Indianapolis, Lansing, Los Angeles, New York City, Philadelphia, Pittsburgh, Rochester, St. Louis, San Francisco, Toledo, Toronto.

Automotive Production

WEEK ENDING	CARS	TRUCKS
Jan. 11, 1958*	120,882	18,433
Jan. 4, 1958	76,653	12,704
Jan. 12, 1957	147,129	20,322
Jan. 5, 1957	91,130	11,087
TO DATE 1958	166,892	26,370
TO DATE 1957	235,198	29,191

*Preliminary Source: Ward's Reports

turing. Currently, the heavies are dominated by Mack, White, Diamond T, International and a number of smaller specialized truck makers.

Just what effect Ford's entry into the heavy field will have on these smaller, but well established truck makers remains to be seen. As a sales representative for one of these firms said, "Anyone with one truck for sale is competition."

Selling Points—What is Ford offering in the way of competition in its big vehicles? For one thing, a big new V-8 engine. It was designed specifically for use in big trucks. Actually, several displacement and horsepower ratings make the new engine several engines. They have the highest horsepower of commonly-used gasoline truck engines. (A limited production West Coast truck maker has a larger gasoline truck engine.)

With displacements of 401, 477 and 534 cu in., the new V-8 engine develops gross horsepowers of 226, 260 and 277 at 7.5 to 1 compression ratios. They are deep-block design and the block is stress-relieved to prevent distortion resulting from operating temperature changes.

Other Features—Machined angle-wedge combustion chambers are in the block instead of the head. Piston tops are step-shaped for greater turbulence and better combustion. This also creates a more efficient "sweeping action" during the exhaust cycle. All valve inserts are alloy steel, exhaust valves are sodium cooled; intake valves are stellite faced for longer life.

An oil pump and oil cooler are located inside the engine, and an aircraft type two-quart oil filter and the air brake compressor are integrally mounted to the block. This eliminates external piping and reduces the possibility of oil leaks.

Sales Setup Ready—A unique, positive acting fuel pump is another feature. Submerged in the fuel tank, the pump is driven by magnetic lines of force from a completely sealed electric motor. The pump pushes, rather than pulls, fuel to the four-barrel carburetor. This positive feed virtually eliminates vapor lock.

Along with the new truck line, Mr. Wright announced a new marketing system for handling sales of the heavies. Some 350 specialized Ford dealers, strategically located around the country, are equipped to service as well as sell the new line. Other Ford dealers, lacking adequate service facilities, will be able to sell the larger trucks by purchasing them from the 350 specialized dealers.

Mack Tries Aluminum—While Ford is adding weight to its line of trucks, another manufacturer was busy taking some off. Mack Co. has built "the largest aluminum dump truck in the world" for the Aluminum Co. of America. It has a capacity of 37½ yds and weighs 27 tons. Alcoa said the aluminum dump box increased the payload by 11,000 lb.

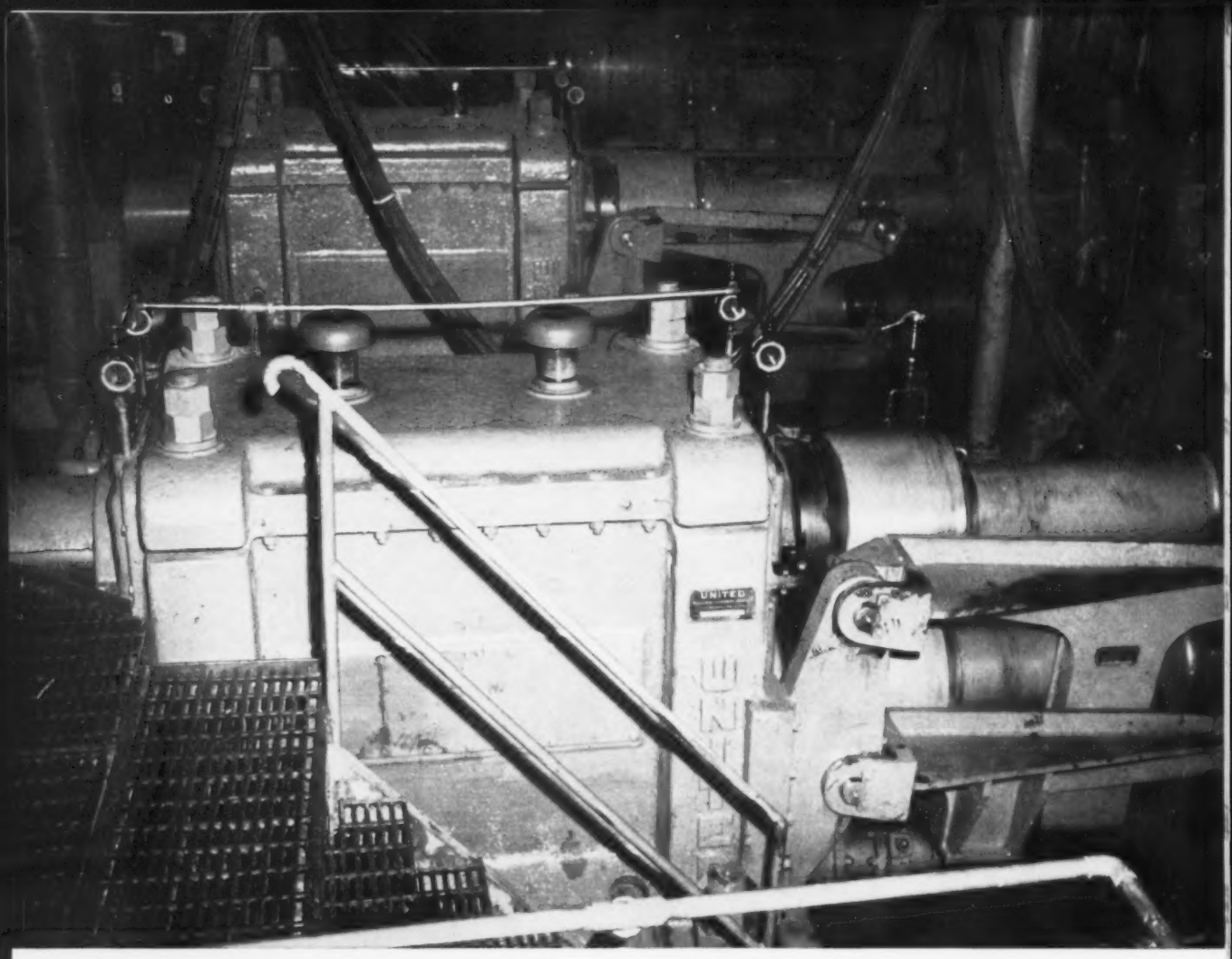
A special feature is the heated dumper floor. Hot engine gases are channeled into the hollow body to facilitate dumping of moist, sticky bauxite. Alcoa will use the truck in the Dominican Republic.

Final Tally on '57 Auto Production

Final Automobile Manufacturers Association production figures for 1957 show Chrysler Corp. came within 749 cars of achieving its goal of 20 pct of the market. Ford gained its largest share of the market since 1930. Surviving independents, as a group, continued to lose ground to the Big Three. And General Motors lost more than 6.5 pct of the industry's output.

Last count showed 6,115,436 passenger cars rolled off U. S. production lines in 1957, up from 5,803,786 in 1956.

THE BULL OF THE WOODS



Working gear-drives harder than ever? EP properties in Meropa give tough protection

Today's heavier loads and higher speeds on gear-drives demand a lubricating film of greater toughness. And extra toughness—far beyond load-capacity requirements—is what you get from Texaco Meropa Lubricant. Its special Extreme-Pressure properties cushion metal surfaces against wear . . . allow gears to run smoothly. Too, polar additives in Meropa insure greater protective adhesion to metals under all conditions—even under shock loads and severe heat, pressure and moisture.

What's more, Texaco Meropa resists oxidation, foaming, thickening. It is stable in use, storage and centrifuging. It does not corrode gear and bearing metals. The result: long equipment life—and low maintenance costs.

There are 10 viscosity grades of Meropa lubricants, to help you get maximum performance from your heavy-duty equipment. A Texaco Lubrication Engineer will gladly help you select the best grade for your needs. Just call the nearest of the more than 2,000 Texaco Distributing plants in the 48 States, or write The Texas Company, 135 East 42nd Street, New York 17, N. Y.

TUNE IN... Metropolitan Opera Radio Broadcasts Every Saturday Afternoon

LUBRICATION IS A MAJOR FACTOR IN COST CONTROL

(PARTS, INVENTORY, PRODUCTION, DOWNTIME, MAINTENANCE)

Pump Priming Gets Under Way

Uptrend Hoped For Before Elections

Federal projects are being pushed at full speed. Administration wants to get business back on the upgrade by November.

Some signs are already in evidence of speeded up Federal projects.—By G. H. Baker.

▪ The Eisenhower Administration is loosening Federal purse strings still further. Top officials are now convinced that a hefty charge of forced-draft spending by the government is now absolutely essential to wipe out unemployment and to restore a semblance of prosperity in time for the November elections.

Worried over continuing sags in production and rising unemployment, White House advisers are quietly passing the word to all departments and agencies of the government to get a few Federal spending projects out of the conference rooms and into the hands of contractors and subcontractors.

For example, the Administration in recent days has:

1. Ordered a speed-up in the letting of Federal highway construction contracts.

2. Told the General Services Administration to speed up its program of building new Federal office buildings and post offices.

3. Eased credit and lending restrictions in Federal housing and home improvement programs.

4. Contracted (with North American Aviation) for test models of an intercontinental bomber capable of 2000 mph and powered by an "exotic" chemical (probably containing boron).

5. Contracted (with Chance Vought Aircraft) for an improved version of Crusader fighter planes.

6. Notified a new list of cities and towns that Nike guided missile sites will be established around their peripheries.

All signs point toward still more spending in the weeks and months immediately ahead. By October, according to the White House calculations, industrial production should be many points higher than at present

Is Ore Taxable?

U. S. Supreme Court will rule next fall on whether states can tax imported iron ore stored for future use.

The Constitution prohibits any state, without the consent of Congress, from taxing any imports or exports. At issue in the case is whether Ohio can levy a personal property tax on iron ore imported from Canada by Youngstown Sheet and Tube and stored for future use.

The question to be solved by the court is when do imported goods lose their foreign status and become simple personal property and subject to state and local taxation. Earlier Supreme Court rulings, one dating back to 1827, hold imports to remain non-taxable as long as they are in their "original package," and in the case of bulk goods, that they generally are not taxable until processed in some manner.

Defense Aid for Depressed Areas

In Ninety Days—The government is planning a sizeable increase in the number of defense contracts to be awarded in so-called distress (widespread unemployment) areas. You can expect to see a noticeable gain within the next 90 days.

It's part of this year's overall White House plan to inject badly-needed procurement dollars into listless manufacturing centers well in advance of the November congressional elections.

Backed by Congress—In both the Senate and the House, there's growing pressure on the executive branch of the government to sidetrack a larger number of defense contracts to unemployment areas. (This means areas where 6 pct or more of the workforce is jobless.)

In addition, demands are increasing for easing contract requirements as they apply to smaller firms. (Small companies complain that exacting government specifications often make it difficult or impossible for them to get into the defense procurement picture.)

Pro's and Con's — Channeling government work into labor surplus areas is not a new government policy. All government procurement officials, particularly those in the Defense Dept., have long been instructed to give preferential treatment to manufacturers in areas designated by the Secretary of Labor as "labor surplus" areas.

This procedure may not be the most efficient way to order defense materials, but it does channel extra dollars to areas where they help, and it provides a psychological boost for employees and employers in the depressed areas.

look your problem in the eye

No need to scratch around for a solution to your grinding wheel problems. Switch to CINCINNATI (PD)° WHEELS. For *now* CINCINNATI GRINDING WHEELS offer POSITIVE DUPLICATION—a remarkable achievement in precision manufacturing and quality control that *can save you money . . . and increase your production.*

And there's no reason to howl when it comes time to duplicate the original wheel when you reorder, for CINCINNATI (PD) WHEELS assure you of POSITIVE DUPLICATION of the original wheel every time you reorder. "On Grade" with a CINCINNATI (PD) WHEEL means all future (PD) wheels will perform and grind exactly alike.

Yet, CINCINNATI (PD) WHEELS will cost you no more than ordinary wheels.

So, today, see your CINCINNATI GRINDING WHEELS Distributor. He'll be glad to explain how (PD) WHEELS will save you money and increase production. Or contact us direct and we'll send one of our representatives—specialists who know grinding and grinding machines as well as grinding wheels. Write, wire, or telephone Sales Manager, Cincinnati Milling Products Division, Cincinnati 9, Ohio.

Remember—only CINCINNATI GRINDING WHEELS give you

(PD) POSITIVE DUPLICATION

CINCINNATI
Grinding Wheels

°Trade Mark Reg. U.S. Pat. Off.

A PRODUCTION-PROVED PRODUCT OF THE CINCINNATI MILLING MACHINE CO.

Shipbuilders Get New Business

Contracts worth $103 million are encouraging shipyards in the Farwest.

Facilities in both Washington and California will share in work.—By R. R. Kay.

■ It looks like clearing skies ahead for West Coast shipbuilders. Some $103 million in new business will go to private and Naval yards. The private yards will certainly welcome their share.

One of Seattle's largest commercial shipbuilding awards seems headed for Puget Sound Bridge and Dredging Co. It's a $29 million order for two 13,000-ton American President Lines freighters. Though the contract isn't signed yet, it's a pretty sure bet for the Seattle firm. San Francisco Bay area yards put in a strong bid for the work, too.

Missile Shipmaking — Puget Sound Bridge and Dredging is in for another nice job: a $5 million contract to build two ferries for Washington State Toll Bridge Authority. It's part of a $30 million program to improve Puget Sound transportation facilities.

The big Naval Shipyard at Bremerton, Wash., starts next summer on a $25 million cruiser conversion job. This work will give the area's shipbuilding industry still another shot in the arm. It will take some 400,000 to 500,000 man-hours to convert the cruiser Fall River to a guided missile ship.

Los Angeles and San Diego will also share in new contracts.

Northwest's Drawbacks

Why doesn't the Pacific Northwest have more manufacturing? High transportation and labor costs. That's the answer from a study by the University of Washington's Bureau of Business Research and the Committee for Economic Development.

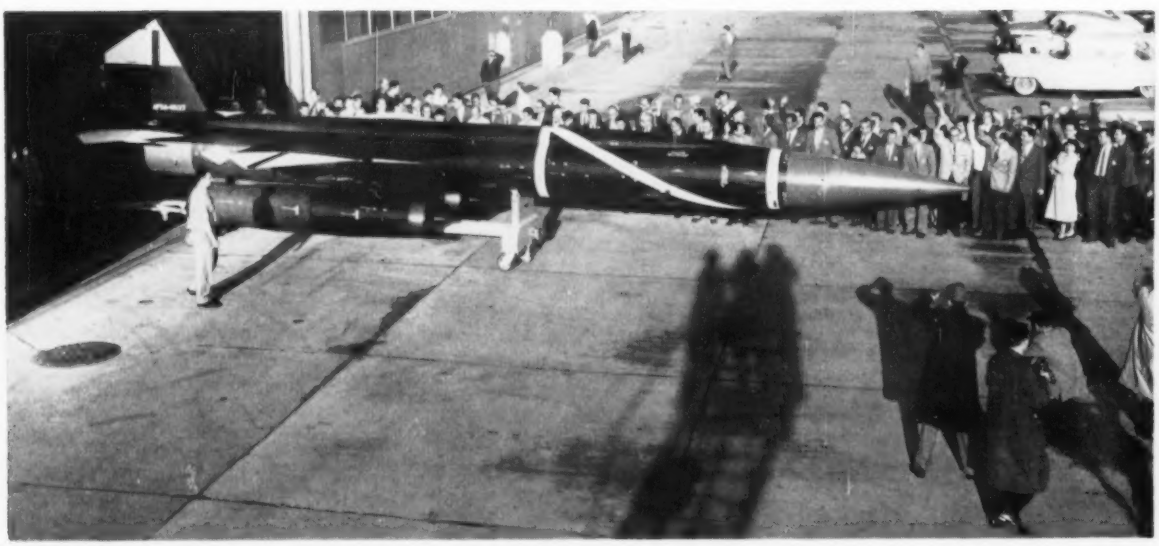
Executives were asked to rate various factors on a one-to-100 scale. They were to give a minus to unfavorable ones, a plus to favorable.

Living Is Easy — The survey comes up with this opinion picture: transportation costs, minus 80; basic wage scale, minus 28; and fringe benefits, minus 22.

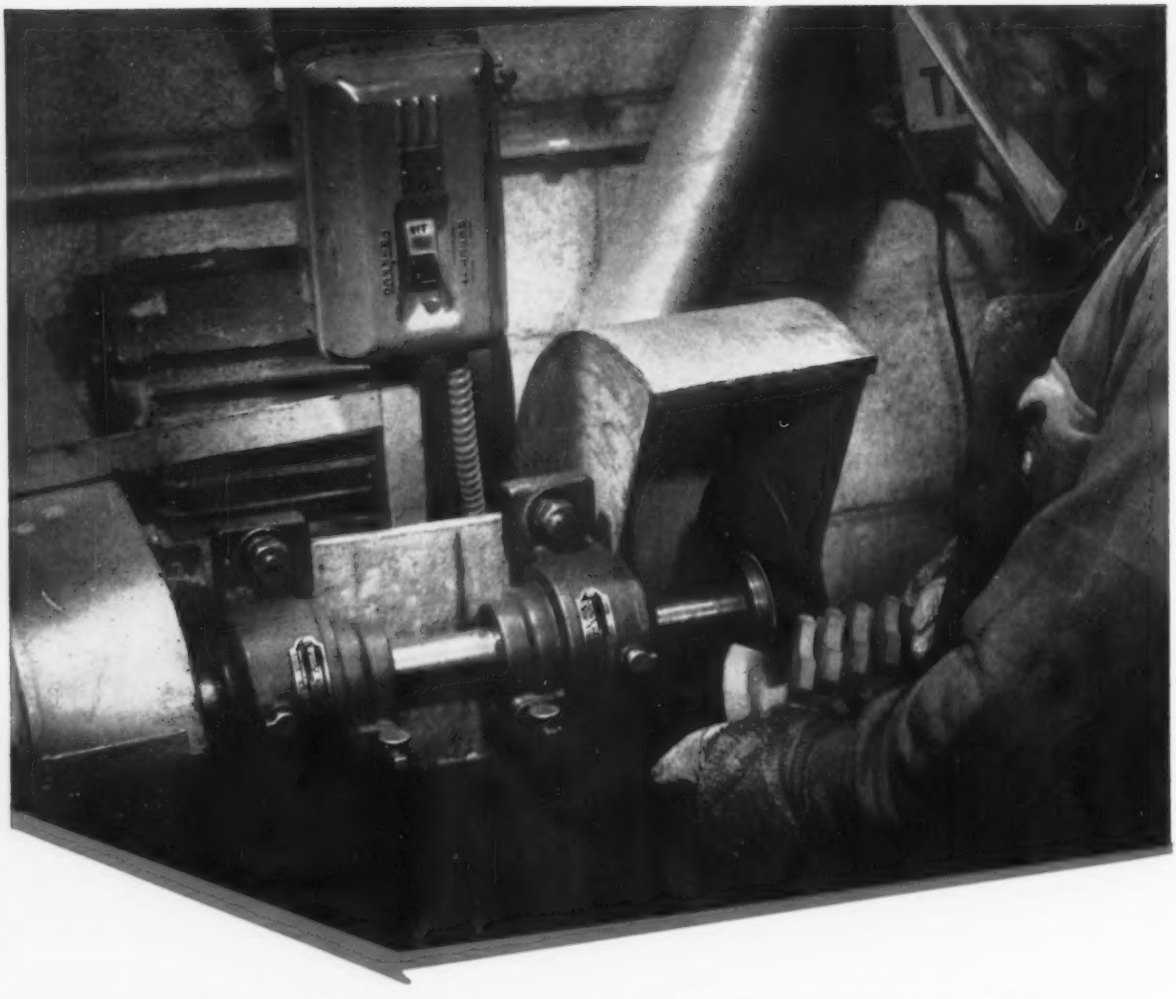
However, labor-management relations come in for a strong plus 64; employee attitudes, plus 59; working conditions, plus 61. And living conditions? A resounding plus 70.

"Partly because of fact and partly because of repetition, businessmen of the Pacific Northwest have come to look on transportation rates as the greatest single obstacle to national distribution," the study says.

First of the Bomarcs Starts Journey to the Air Force



ROLLOUT AT SEATTLE: Initial production model of the Bomarc IM-99 area defense missile is rolled from assembly line at Boeing Airplane Co. Bomarc will be supplied to bases around the United States.



Original bearings cost 50¢ per hour of life... Bearings, Inc. recommended bearings cost less than 10¢ per hour!

The original bearings on this casting cut off machine at Intricast, Inc., Loudonville, Ohio, producers of investment castings, had a maximum life of 48 hours and their cost was approximately $24 each. The bearings recommended by our engineers cost only $17 and have now been in service for over 200 hours . . . and no indications of failure yet!

"Our most severe bearing application with speeds at 5,000 RPM and the bearings subjected to abrasive grit and casting dust," reports the Intricast Plant Manager. "Maintenance has been practically non-existent with our new bearings and the machine is much quieter," he further stated.

This is another example of our engineers' ability to solve acute bearing problems. It makes no difference where bearings are used or how many you buy . . . As authorized distributors we guarantee you factory fresh, latest type bearings ready to deliver long life and trouble free service.

Call our branch nearest you NOW!

Providing bearing service in the North ➤ **BEARINGS, INC.**

OHIO: Akron • Canton • Cincinnati • Cleveland • Columbus • Dayton • Elyria • Hamilton • Lima • Lockland • Mansfield • Toledo • Youngstown • Zanesville
INDIANA: Ft. Wayne • Indianapolis • Muncie • Terre Haute • **PENNSYLVANIA:** Erie • Johnstown • Philadelphia • Pittsburgh • York
WEST VIRGINIA: Charleston • Huntington • Parkersburg • Wheeling • **NEW JERSEY:** Camden
NEW YORK: Buffalo, Balanrol Corp. • **MARYLAND:** Baltimore • **DELAWARE:** Wilmington

and in the South ➤ **DIXIE BEARINGS, INC.**

FLORIDA: Jacksonville • **GEORGIA:** Atlanta • **KENTUCKY:** Louisville • **LOUISIANA:** Baton Rouge • New Orleans
N. CAROLINA: Charlotte • Greensboro • **S. CAROLINA:** Greenville • **TENNESSEE:** Chattanooga • Kingsport • Knoxville • Nashville

New Lease on Cutting Tool Life

Super Cutting Speeds Bypass the 'Valley of Death'

Is there a point beyond which speed will prolong tool life, rather than shorten it?

Experiments by Lockheed indicate this might be the case.— By E. J. Egan, Jr.

▪ Did you ever hear the term "valley of death" applied to machining operations? Your machines and cutting tools have probably ventured into it many times. It's that point of high machining speed where cutting tools fail rapidly.

The natural tendency is to back out of the "valley of death" in a hurry—reduce the speed so that cutting edges won't wear too fast.

But Wait—Here's a good question: What if you push forward into the "valley"? If you boost the speed way up, will the cutting tool do its job with undreamed of efficiency and still emerge unscathed?

This is the theory of a "critical machining velocity." It conjectures that there is a point of super cutting speed beyond which tool failure will occur very slowly, if at all.

Lockheed Tries It—Researchers at Lockheed Aircraft Corp. have been testing the critical-velocity theory with — of all things — a Mauser rifle.

According to Alfred H. Peterson, a group engineer in the firm's Producibility Methods Dept., the rifle has a smooth barrel bored out to take a 0.300-in. diam slug. A tool holder is mounted on the muzzle end and the rifle and holder assembly is set up on a firm base.

Many Tools Tested—Two-inch long slugs of AISI 4130 steel, heat treated to 280,000 psi tensile strength, are loaded into cartridge cases. Each test consists of firing a slug past a single point tool gripped in the muzzle-end holder.

Various alloy and carbide tools have been used. Some were ground to a 90° included angle; a second setup used a flat nose tool. Muzzle velocity of slugs fired past the 90°-angle tools averaged 2200 fps, which figured out to 132,000 sfpm. Slug velocity for the flat nose tool was boosted to 162,000 sfpm.

Hardness Increased — Definite cutting action was observed in all tests. There was no tool failure except for one 90° carbide tool tip. Cuts were smooth, averaging 20-microinch finishes with the flat nose tool.

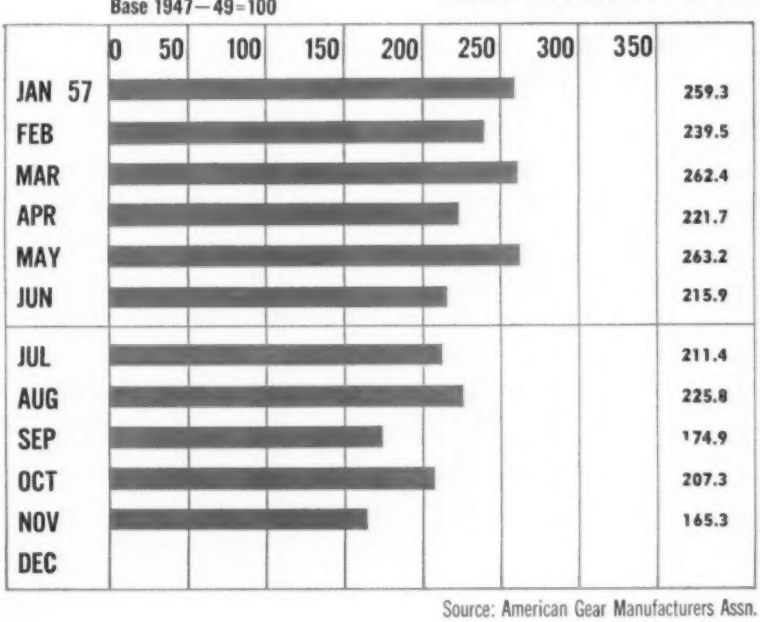
Hardness of the slugs was increased 1 to 4 points Rc to a maximum depth of 0.010 in. below the machined surface. But there were no other measurable effects on strength or structure.

Chip Mystery — What about chips from this bullet-machining technique? Anderson says they haven't been able to find any.

Lockheed will continue these tests on a more elaborate scale. From the results, the firm hopes to establish critical machining velocities for all common aircraft materials.

From that point, it will be up to the machine tool builders to produce equipment with the necessary speed and rigidity.

GEAR INDEX 1957



Source: American Gear Manufacturers Assn.

INDUSTRIAL BRIEFS

National Steel Acquisition—National Steel Corp. has purchased the Enamelstrip Corp., Allentown, Pa. The company manufacturers enameled, lacquered and laminated steel in coils. The newly-purchased business will continue under the name of Enamelstrip Corp. and will be operated as a wholly-owned subsidiary of National Steel. Arthur Uhleen, executive vice president of the Allentown firm, will occupy the same position with the new National Steel Corp. subsidiary.

Lakes Fleet Grows—Two new ore carriers on order from Great Lakes shipyards will use propulsion equipment manufactured by General Electric. One vessel of 23,000-DWT will be constructed by the Great Lakes Engineering Works, River Rouge, Mich., for the Interlake Steamship Co., Cleveland. The other, a 25,000-DWT vessel, will be assembled on the ways of the American Ship Building Co., Toledo, O., for the Shenango Furnace Co., Pittsburgh.

Bubbling Over — The Dayton Rubber Co. has formed a new division due to the rapid expansion of sales in the plastic foam field. All Dayton Rubber plastic foam products, or polyesters and polyether urethanes, will be marketed under the trade name of Stafoam. Production facilities have been expanded for the newly formed urethane division. They are located at Marietta, O., and Hawthorne, Calif.

"Even the finest engines in the world need refueling."

Labor Press—The first official directory of the labor press of the U. S. and Canada has been issued by the International Labor Press Assn., AFL-CIO. The 92-page book estimates total circulation of publications at 20 million, besides listing the 301 newspapers and magazines owned or sponsored by labor unions which are members of ILPA. Copies may be obtained from the association in Washington, D. C.

Service Station — The Fluor Corp., Ltd. has a contract to design, engineer and construct a 75 million cubic-feet-per-day gas treating and dehydration plant. The facility will be located in McMullen County, Texas, for Transcontinental Gas Pipe Line Corp. Installation, costing in excess of $2 million, will remove acid and water from gas before it is sent through pipelines, thereby reducing corrosion of the line.

Sun Never Sets—An agreement has been completed whereby Imperial Chemicals Industries, Ltd., London, England, will produce electric salt bath furnaces under license by Ajax Electric Co., Philadelphia. It will feature salt bath furnaces incorporating basic Ajax designs and features throughout the British Commonwealth including Australia, S. Africa, New Zealand and India. Furnaces will be marketed under the trade name of Ajax-Cassell.

Lifting a Heavy Order—Reading Crane & Hoist Corp., Reading, Pa., has orders from U. S. Steel Co. and Bethlehem Steel Co. for three specially engineered cranes. Two special cranes have been ordered by U. S. Steel to handle steel plate in its S. Chicago, Ill., works. The third crane, for Bethlehem Steel, will be placed in the company's Pottstown, Pa., plant. All equipment on the contracts, totaling more than $200,000, is scheduled for delivery in January and February.

Formula for Success — Stauffer Chemical Co. plans to construct a large hydrofluoric acid plant at Louisville, Ky. Decision to construct the new facility was based upon the rapidly expanding demand for this industrial chemical. The plant will be located adjacent to Stauffer's present petrochemical plant. The hydrofluoric project will be designed and engineered by Stauffer's Engineering Department.

Adding Assets — Van Norman Industries has acquired the business of Digit-Ometer Co., Denver, Colo. Acquisition included patents applications, inventory, tools and dies. Payment for the business by Van Norman was made by cash and common stock plus a percentage on certain future sales. New business will be added to Van Norman's Electronics Div. at Manchester, New Hampshire.

Cable Address — Ground has been broken for a new factory warehouse for The Paranite Wire & Cable Div. of the Essex Wire Corp. It will be located adjacent to the Marion, Ind., manufacturing plant. As part of the $1 million Paranite expansion program, this new warehouse with over 100,000 sq ft of floor area, will provide facilities for the storage and immediate shipment of the various Paranite Wire & Cable products.

Reorganized—The National Design & Detailing Co., Pittsburgh, Pa., has been reorganized as a Pennsylvania corporation to be known as NADCO Engineering Co. It will be headquartered at 3633 Brownsville Rd., Pittsburgh. For many years the company has been engaged in general engineering and consultants for welded fabrications & structures. Mr. Steve Darko has been named president of the firm.

New England Outlet — Peterson Steels, Inc., Union, N. J., has recently opened a New England district sales office. It is located at 530 Silas Deane Highway, Wethersfield, Conn. L. P. Costanzo, has been named district sales manager.

Columbia Tool Steels for 1957-58
with A.I.S.I. Identification and Type Classification of Tool Steels

GRADE	Identifying Elements, in Per Cent										
	Type	C	Mn	Si	Cr	Ni	V	W	Mo	Co	Cb
HOT WORK TOOL STEELS — TYPE SYMBOL H											
H1-H19, INCL., CHROMIUM BASE TYPES (H1-H10 AND H17-H19 UNASSIGNED)											
FIREDIE-CASTDIE	H11	.35	—	—	5.00	—	.40	—	1.50	—	—
ALCODIE	H12	.35	—	—	5.00	—	.40	1.50	1.50	—	—
VANADIUM CASTDIE	H13	.35	—	—	5.00	—	1.00	—	1.50	—	—
	H14	.40	—	—	5.00	—	—	5.00	—	—	—
	H15	.40	—	—	5.00	—	—	—	5.00	—	—
	H16	.55	—	—	7.00	—	—	7.00	—	—	—
H20-H39, INCL., TUNGSTEN BASE TYPES (H27-H39 UNASSIGNED)											
	H20	.35	—	—	2.00	—	—	9.00	—	—	—
FORMITE 2	H21	.35	—	—	3.50	—	—	9.00	—	—	—
	H22	.35	—	—	2.00	—	—	11.00	—	—	—
	H23	.30	—	—	12.00	—	—	12.00	—	—	—
FORMITE 3	H24	.45	—	—	3.00	—	—	15.00	—	—	—
	H25	.25	—	—	4.00	—	—	15.00	—	—	—
CLARITE J	H26	.50	—	—	4.00	—	1.00	18.00	—	—	—
CLARITE HW	H26	.50	—	—	4.00	—	1.00	18.00	—	—	—
H40-H59, INCL., MOLYBDENUM BASE TYPES (H40, H44-H59 UNASSIGNED)											
	H41	.65	—	—	4.00	—	1.00	1.50	8.00	—	—
	H42	.60	—	—	4.00	—	2.00	6.00	5.00	—	—
MOLITE HW 10	H43	.55	—	—	4.00	—	2.00	—	8.00	—	—

Third of a Series of Six Charts Covering A.I.S.I. Tool Steel Type Classifications

COLUMBIA TOOL STEEL COMPANY • CHICAGO HEIGHTS, ILLINOIS

CENTRAL OFFICE AND WORKS, CHICAGO HEIGHTS, ILLINOIS — BRANCH STOCKS IN THE FOLLOWING CITIES:

Chicago 32, 4832 S. Kedzie Ave., Phone LAfayette 3-3632
Cincinnati 25, 2716 Spring Grove Ave., Phone MUlberry 1-8400
Cleveland 14, 1640 St. Clair Ave., Phone MAin 1-1785
Detroit 3, 121 Oakman Blvd., Phone TUlsa 3-3770
Los Angeles 22, 6955 E. Bandini Blvd., Phone RAymond 3-4684
Milwaukee 19, 5202 W. Lincoln Ave., Phone LIncoln 3-5200
St. Louis 13, 5118 Easton Ave., Phone FOrest 1-0641

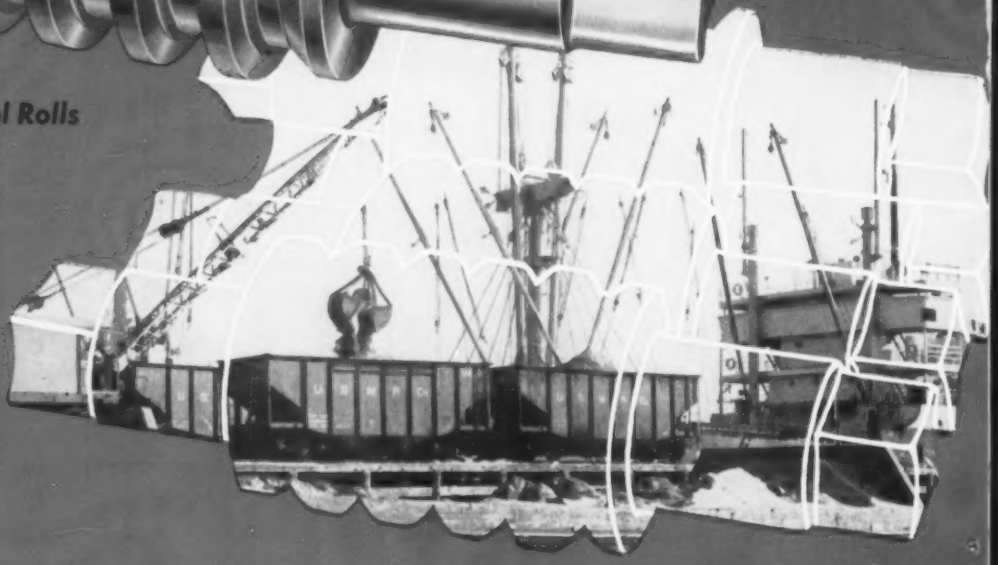
REPRESENTATIVES IN THE FOLLOWING CITIES: Dayton, Erie, Grand Rapids, Hartford, Indianapolis, Louisville, Moline, Newark, Portland and St. Paul

TOOL COLUMBIA STEELS

COLUMBIA TOOL STEELS

HIGH SPEED STEELS: Clarite — Vanite — Carvite — Acmite — Cobite — Maxite — Molite — Molite Smoothcut — Molite #3 DIE STEELS: Superdie — Atmodie — Atmodie Smoothcut — E-Z-Die Smoothcut — Oildie — Exl-Die — Framdie SHOCK RESISTING STEELS: Buster Alloy — CEC Smoothcut CARBON TOOL STEELS: Columbia Special — Vanadium Extra — Waterdie Extra — Columbia Extra — Columbia Extra Headerdie — Vanadium Standard — Waterdie Standard — Columbia Standard — Columbia Electrex

Ohio Rolls



Ohio Iron and Steel Rolls

Carbon Steel Rolls
Ohioloy Rolls
Ohioloy "K" Rolls
Flintuff Rolls
Double-Pour Rolls
Chilled Iron Rolls
Denso Iron Rolls
Nickel Grain Rolls
Special Iron Rolls
Nioloy Rolls
Forged Steel Rolls

shaping metal for all Industry

THE OHIO STEEL FOUNDRY CO.
LIMA, OHIO

Plants at Lima and Springfield, Ohio

ORIO

H. A. Rentschler, elected president, Fabricated Steel, Inc., Hamilton, O.; **W. J. Wolf,** elected vice president; **F. B. Helvey,** named secretary-treasurer.

W. C. Hale, Jr., elected president, South Chester Tube Co., Chester, Pa.

O. E. Kline, elected vice president, Union Tank Car Co., Chicago.

L. B. Rousseau, elected president and treasurer, Ajax Electric Co., Philadelphia.

T. E. Lee, elected vice president, manufacturing, Virginia Metal Products, Inc., Orange, Va.

Walter Boyce, appointed vice president, production, Highway Products, Inc., Kent, O.

L. W. Randt, appointed director, program planning, The Oliver Corp., Chicago.

R. W. Graham, appointed general superintendent, Homestead District Works, U. S. Steel Corp.

J. D. Peters, appointed asst. to vice president, purchases, U. S. Steel Corp.

E. G. Sheasby, appointed general manager, sales, Bliss & Laughlin, Inc., Harvey, Ill.

J. E. Paumier, appointed general superintendent, Canton Div., E. W. Bliss Co.

R. O. Baum, elected executive vice president and general manager, Tennessee Products & Chemical Corp., Nashville, Tenn.

G. T. Humphrey, Jr., appointed general manager, Service Sales Div., The Timken Roller Bearing Co., Canton, O.

J. A. Hagan, appointed asst. to vice president, operations, U. S. Steel Corp.

I. J. Billera, elected senior vice president, U. S. Industries, Inc.; **J. J. Hoffer,** elected vice president, marketing.

Carl Siegwarth, appointed sales manager, Lombard Corp., Youngstown, O.

H. P. Smith, appointed director, research, Associated Spring Corp., Bristol, Conn.

J. W. McCann, named Boston district manager, Edison Storage Battery Div., Thomas A. Edison Industries, McGraw - Edison Co., West Orange, N. J.

H. G. McMurry, appointed manager, Ford Motor Co.'s aluminum casting plant, Sheffield, Ala.

W. H. Holman, named asst. vice president, Wheeling Steel Corp.

W. E. Daily, named sales manager, Steel Tube Div., Southern Fabricating Co., Sheffield, Ala.

C. E. Price, appointed asst. regional manager, Westinghouse Electric Corp.'s Manufacturing and Repair Div., Southeastern region, Atlanta, Ga.

E. J. Flynn, elected president, Alabama Dry Dock & Shipbuilding Co., Mobile, Ala.

F. R. Chippiga, named asst. to manager, promotion and market

analysis, Alloy Tube Div., The Carpenter Steel Co., Union, N. J.; **R. W. Faust,** appointed sales office manager; **William Vath** becomes asst. to the divisional controller.

J. F. Connaughton, elected president, Wheelabrator Corp., Mishawaka, Ind.

G. P. Krumlauf, appointed asst. to the manager, sales, Pig Iron and Coal Chemicals Div., Republic Steel Corp.

R. G. Lambert, promoted to asst. division controller, Stainless Steel Div., Jones & Laughlin Steel Corp.

W. P. Bell, appointed manager, Industries Group sales, Washington, D. C., office, Allis-Chalmers Mfg. Co.

C. W. Bruce, appointed chief engineer, Republic Steel Corp. steel plants.

R. W. Strasser, named district sales representative, Berger Div., Canton, O., Republic Steel Corp.

Alexander Ferko, appointed manager, Flat Products Div., Lombard Corp., Youngstown, O.

I. I. Steinberg, appointed general manager, Vibro-Ceramics Div., Gulton Industries, Inc., Metuchen, N. J.

B. J. McFeeley, appointed sales manager, Northern California Div., Ducommun Metals & Supply Co., Berkeley, Calif.

N. E. Staresina, appointed plant manager, Gary, Ind., plant, Gary Screw and Bolt Div., Pittsburgh Screw & Bolt Corp.

R. P. Fierst, appointed asst. treasurer, Copperweld Steel Co., Pittsburgh.

J. M. Martin, Sr., named manager, Design Dept., and **P. L. Ashway,** appointed manager, fabrication services, Datalab, Div. of Consolidated Electrodynamics Corp., Pasadena, Calif.

G. E. Brooks, appointed asst. general manager, sales, Atlantic Steel Co., Atlanta, Ga.

J. P. Dana, appointed asst. superintendent, orders, Seattle plant, Bethlehem Pacific Coast Steel Corp.

H. D. Rowe, appointed director, manufacturing, Cummins Engine Co., Columbus, Ind.

H. F. Graff, A. P. Kerschbaum and **C. E. Ward,** appointed senior research engineers, Armco Steel Corp., Middletown, O.; **E. E. Den-**

hard, appointed senior metallurgist, Baltimore Research Laboratories.

R. E. Johnson, appointed engineer, Eastern and New England districts, Firth-Loach Metals, Inc., McKeesport, Pa.

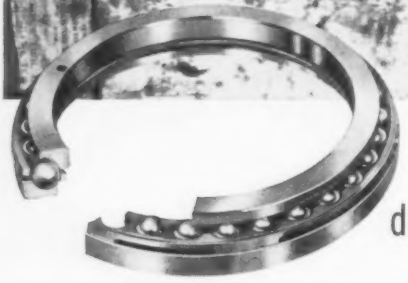
F. M. Darner, appointed chairman, engineering coordinating committee, Republic Steel Corp.

Rea Anderson, appointed chief metallurgist and head, Quality Control Dept., Standard Steel Corp. of Los Angeles.

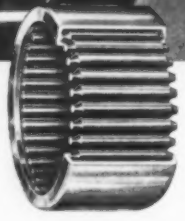
J. A. Maggetti, named asst. plant manager, Kaiser Steel Corp.'s Napa, Calif., plant.

J. M. Matthews, appointed director, sales, magnetic and electronic materials, Allegheny Ludlum Steel Corp., Pittsburgh.

E. M. Branch, appointed engineering representative, Stainless Processing Div., Wall Colmonoy Corp., Detroit.



from drilling rigs...



to automobiles

Torrington makes the right anti-friction bearing for every basic need!

In the oil fields where your gasoline originates, the need may be for a special Torrington Angular Contact Rotary Table Bearing to support thousands of feet of whirling drill string. In your car, it may be a compact Torrington Needle Bearing to smooth your steering.

Between these two examples lie all kinds of requirements. To meet this broad range of needs, Torrington makes every basic type of anti-friction bearing.

You can be confident that engineering recommendations from Torrington will bring the broadest experience to bear on your specific application requirements. For help in developing the *right* anti-friction application for your product, rely on your Torrington representative. **The Torrington Company, Torrington, Conn. —and South Bend 21, Ind.**

TORRINGTON BEARINGS

District Offices and Distributors in Principal Cities of United States and Canada

NEEDLE • SPHERICAL ROLLER • TAPERED ROLLER • CYLINDRICAL ROLLER • BALL • NEEDLE ROLLERS • THRUST

NEW PRODUCTS: Getting them out of the planning stage and into full production is a job for OR.

Can You Profit From Operations Research?

By R. H. Eshelman—Engineering Editor

Can science show businessmen how to manage better? Once the answer would have been an emphatic no!

But today, both large and small firms reap big benefits from operations research.

If your problems can be stated in figures, chances are it'll pay to look into the technique.

▪ What's the best way to manage a firm's resources of men, money, machines, materials and time? Certainly, managers need all the help they can get in making decisions these days; industrial situations are complex to say the least.

If scientific methods can raise your firm's batting average, they ought to be well worth while. That's the promise of operations research (OR).

What It Is—According to Robert O. Ferguson, a principal of Methods Engineering Council, Pittsburgh, there's nothing mystifying about it. Primarily, he says, OR is the application of mathematics to management problems. You collect a group of people with diverse backgrounds to size up problem areas objectively. They can be your own people. Or they can include outside experts.

Top management needn't concern itself too much with the actual mechanics. You don't have to be an Einstein to use OR in your company, anymore than you need to understand internal combustion engines to drive a car, Ferguson points out.

First you have to be able to analyze your problem in figures. And you must have well defined objectives—know what you hope to gain. Some trained personnel are a must, also. Good basic data is needed, too, or at least the possibility of developing it. And finally the program must have continuity—it takes time to work it out and get the benefits. Giving up at the halfway mark can be costly.

Good For All—This may be fine, many small firms say, but we don't have the experts and can't afford to hire them. Other questions asked are: Will operations research pay off in our case? What can we gain by it? What are the pitfalls to avoid? Where won't it work? Once we're sold on it how do we get started?

Consultants in the OR field say that a company's size doesn't matter—the approach works for both large and small firms.

There are a number of reasons why companies get into such a program. Some feel forced to adopt these new techniques because competitors are using them. Or perhaps profits are slipping, although sales

Keys to a Good Operations Research Program

Define Your Objectives: Lower production costs, reduced inventory, better marketing, improved product, etc.

Top Management Support: Active backing in money and choice of objectives is necessary.

Trained Personnel: Good background in mathematical and statistical techniques.

Continuity: Benefits may be several months or even a year in coming.

Good Basic Data: You may have to revise your cost accounting and other record systems.

remain fairly steady. Maybe manufacturing-cycle times are increasing and inventories getting out of hand. So management turns to OR for a thorough, unbiased analysis.

How It Pays Off — The payoff most firms want is in dollars and cents. For instance, Robert E. Lewis, head of Argus Cameras Div. of Sylvania Electric Products, Inc., says that OR applied to make-or-buy decisions is worth a good $50,000 a quarter to the firm. And nine-tenths of the former cost of taking inventory is saved by statistical sampling methods developed through OR techniques, James Brinkerhoff, factory manager, reports.

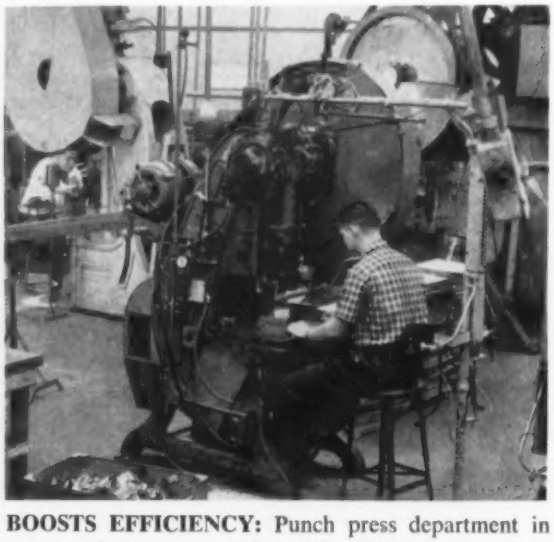
There are other, less tangible, benefits of course. It's hard to put a dollar value on more effective management. But because decisions are based on better information, management can be more objective. Another intangible benefit is the fact that an OR program gives people in the ranks management training.

Tools Used—This effort to use the scientific method in business requires certain tools, usually mathematical. They include linear programming, statistics and probability, feed back control principles, queues or waiting lines, game and information theories, and electronic computers.

Steps in the actual procedure may involve:

1. Defining the problem—which is often different from the one you think you have.
2. Collecting data on factors affecting results. Analyzing all data and other information about problems.
3. Establishing a realistic yardstick for measuring results.
4. Developing models (often mathematical) to represent the system under study.
5. Testing each model on sample problems to make sure it represents the system accurately.
6. Developing working tools to achieve desired results. These should be simple enough for op-

PROGRAMMED PRODUCTION: Linear programming solves job assignments for machines and men in Argus' automatic screw machine department.



BOOSTS EFFICIENCY: Punch press department in camera plant was a good spot for OR to achieve better use of time, machines, materials.

erating personnel to use in routine decisions.

7. Integrating the new methods into company operations.

Typical Case—To show how this works out in practice, let's look at the experience of Argus Cameras. Although a major producer of photo equipment, the firm is relatively small by most standards. It uses a wide variety of machined and stamped parts and assemblies. Because the business is seasonal, the company buys some of these. This helps to level employment and hold down capital investment.

When Argus officials first became interested in OR, they had several questions in mind. Were they getting the best use out of facilities? Which parts should they make and which should they buy? Could they cut inventory costs?

Also the timing was important. Robert Lewis feels that, in prosperous periods, a firm should prepare to weather readjustment cycles. The OR program was started when profits were high.

Consultants Hired — The plant faced the usual small company handicaps: lack of experts, limited budgets, no previous experience with OR techniques, limited staff time available. But preliminary surveys indicated that OR could indeed make a contribution, over and above the cost of consulting services.

The chosen consulting firm mapped out a plan for training company personnel. Top management got needed background in a series of briefing luncheons. Middle management met evenings. Operating personnel were trained in specific procedures in half-day sessions.

Handicaps Overcome—In many respects Argus was fortunate. For instance, several competent mathematicians turned up on the staff. All they needed was a refresher in math and some drilling in OR methods. Also, because of active top level support, there was little skepticism of the program in the ranks.

While personnel training went on, the consultants developed specific money-saving ideas. For instance, they evolved a make-or-buy form. All such decisions are now based on actual profit or loss margin to the company.

SAMPLING SAVES: Statistical sampling methods simplify inventory taking, save as much as nine-tenths of former annual cost.

Data formerly available (as is often the case) was not well suited to this use. Records now used for make-or-buy decisions include figures on material costs, labor and burden, fixed cost, variable purchase costs, lot quantities, and the resulting profit advantage or loss.

Machine Scheduling — The OR study also developed a simplified, algebraic system of linear programming to get the best job mix from available equipment. Workers knowing little more than high school math can handle this job. They use a large wall chart to coordinate critical screw machine and stamping jobs and equipment, the plant's highest volume factors. Now management has quantitative data for better controls, more economic production, and detailed schedules, spanning a longer period.

The OR inventory study at Argus has two phases. Before the study, all parts were controlled by perpetual inventory records and by expediting. A cheap part got the same control as an expensive one.

The study showed, however, that 47 pct of the record keeping and a corresponding amount of expediting was devoted to items valued at only 2 pct of dollar volume. By ordering a planned excess of low cost items, the company found it could avoid most record keeping and expediting.

Other Benefits — OR techniques have also helped in developing new products, and in determining the most economical production methods. For instance, should a part be a stamping or a die casting? Other OR gains include more accurate cost figures for annual reviews.

OR is no cure-all, Ferguson and other consultants warn. Mathematical and statistical procedures have definite limitations and are far from being fully developed. Although sound data can provide a more logical basis for decisions, it cannot make them—managers must still manage. In the end, the ultimate success of such a program depends on the ability and progressive attitude of everyone concerned.

Reprints of this article are available as long as the supply lasts. You may obtain a copy from Reader Service Dept. The IRON AGE, Chestnut & 56th Sts., Philadelphia 39, Pa.

Cold Retort Furnace Brazes High-Temperature Honeycomb

By R. R. Giler—Industrial Heating Div., Westinghouse Electric Corp., Meadville, Pa.

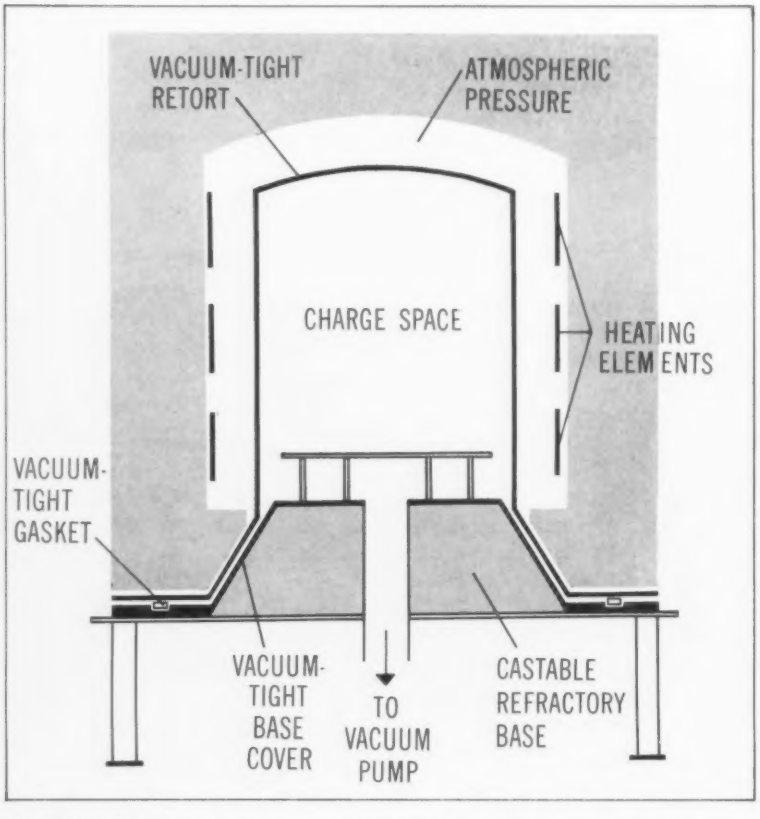
Vacuum furnaces are fast becoming the standard means of brazing stainless steel honeycomb panels.

But as brazing temperatures go higher, problems in retort life mount in proportion.

▪ In making honeycomb panels from high-temperature metals such as stainless steels, it's generally necessary to join the cover sheets and core by brazing. This calls for special techniques, mainly because of stainless steel's tendency to oxidize and discolor.

Stainless is usually brazed in a standard furnace equipped with a special alloy retort. Air is removed from the retort by first purging with a noncombustible atmosphere that will not react with hydrogen, then purging that atmosphere with dry hydrogen.

In brazing honeycomb materials, however, a new problem is introduced. With all the small cells of the honeycomb filled with air, and both sides covered by a flat panel, it's hard to purge the air and replace it with hydrogen. This is where vacuum purging comes into play. Vacuum draws out all the air, and the furnace is simply backfilled with hydrogen.



GASKET SEALS: Single-pumped hot retort bell-type furnace has vacuum in retort, atmospheric pressure between it and furnace shell.

Basic Furnace Type—Furnaces for vacuum purging are known as single-pumped hot retort furnaces and are made vacuum-tight with a neoprene synthetic rubber gasket. In general, these furnaces are either of the bell or pit type.

Single-pumped hot retort furnaces have a temperature limitation, due mainly to softening of the retort alloy at high temperatures. Compressive stresses caused by atmospheric pressure tend to collapse the vacuum retort. Therefore, a large size furnace of this type should not operate above 1700°F. By using very heavy retorts it's possible to operate some of these furnaces up to 2100°F.

To eliminate this effect of atmospheric pressure at high temperature a hot retort double-pumped type is used. Here, the shell of the furnace proper is also made vacuum-tight and a rough vacuum is maintained between the retort and the outer shell of the furnace. Since this area includes the bricking, vacuum better than 1 mm Hg is hard to obtain. This is sufficient, however, to eliminate stresses.

Used For Titanium — Double-pumped furnaces are widely used in the titanium industry, where very large furnaces are needed for temperatures of 1600°F. They also find use in brazing applications where temperatures are expected to be up to 2100°F.

At very high temperatures, a point is reached where even the best alloys won't be strong enough to maintain good vacuum. For these conditions, a completely different type of furnace has been created.

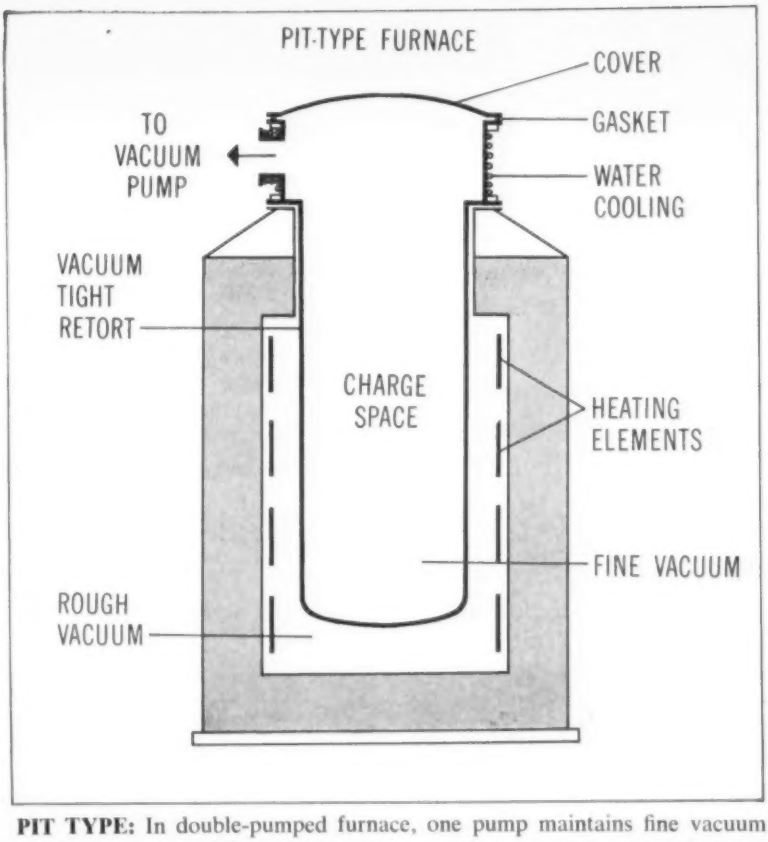
Standard hot retort furnaces have heating elements between the retort and outer shell; heat is radiated from the elements to the retort, which in turn reradiates heat to the charge. In a new furnace developed by Westinghouse, heating elements are placed inside the retort. Since in a vacuum all heat transfer is by radiation only, this radiation can be stopped by means of shields. Therefore, radiation shields between the heat source and the vacuum-tight retort of the Westinghouse Kold-Retort furnace make it possible to keep the retort at a low temperature by means of water cooling.

Already In Service—No bricking is used in such a furnace, so heating and cooling rates can be very fast. A recirculating fan can also be used inside the furnace to speed up the cooling cycle, during which an inert gas is recirculated first over the charge and then over the water-cooled retort. Thus, the furnace itself acts as a built-in heat exchanger.

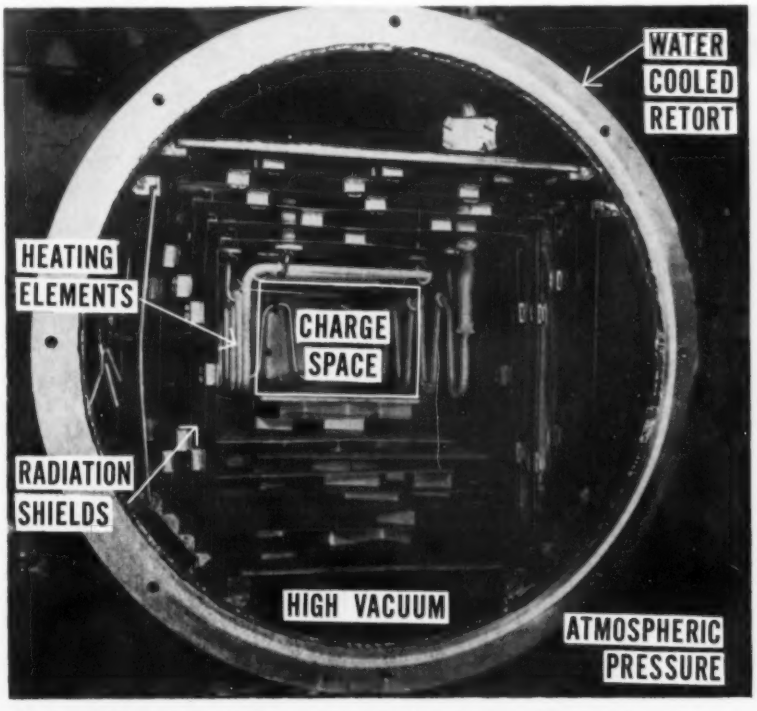
The first Kold-Retort furnace, with a charge space of 4 x 4 x 12 ft, is in operation in the titanium industry. Cycle times are less than half those obtained in a similar-size hot retort furnace.

A small furnace with a charge space 2 x 2 x 4 ft has been specially designed for brazing aircraft heat exchangers and honeycomb structures.

Another furnace, now under construction for an aircraft engine manufacturer, has a charge space 6 ft diam by 4 ft high. Rated at 600 kw and designed for temperatures up to 2250°F, it will braze or vacuum treat special high-temperature alloys. Furnaces of this type can be built to operate at temperatures around 4000°F.



PIT TYPE: In double-pumped furnace, one pump maintains fine vacuum inside the retort while another creates rough vacuum in space between retort and outer shell.



NEW DESIGN: Westinghouse Kold-Retort furnace has heating elements inside and shields to keep heat away from water-cooled retort.

Ti-7Al-3Mo Alloy Stays Strong

By F. A. Crossley, Senior Metallurgist, Armour Research Foundation, Illinois Institute of Technology, Chicago

A new titanium alloy is showing up well in tests to check its high-temperature strength and stability.

Heat treatment of the material is most important. Here are the facts.

• The alloy Ti-7Al-3Mo promises to be important for high temperature applications. It may extend the upper temperature limit at which titanium forgings can be used. It may also prove stronger than other alloys in the present useful temperature range.

Ti-7Al-3Mo was developed by Armour Research Foundation under sponsorship of the Materials Laboratory, Wright Air Development Center. It resulted from a search for an alloy that would have at least 10 pct tensile elongation and be stable under high temperature creep conditions.

Forging and heat treating data were collected for three structural types of the alloy: a Widmanstatten structure, Fig. 1; an equiaxed structure with underaged beta, Fig. 2; and an equiaxed structure with fully

Three Structural Types of Ti-7Al-3Mo Alloy

Magnification: 750X

Etchant: 20 pct HF, 20 pct HNO_3, balance glycerine

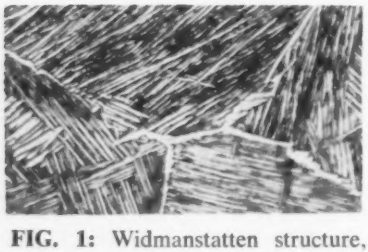


FIG. 1: Widmanstatten structure, alpha plus beta. Heat treatment: 1950°F for ½ hr, air cooled; 1000°F for 24 hr, air cooled.

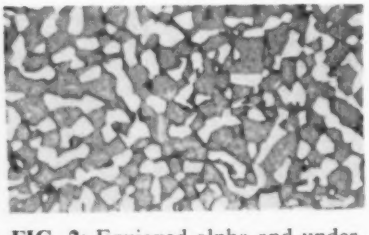


FIG. 2: Equiaxed alpha and underaged beta (light). Heat treatment: 1800°F for 1 hr, water quenched; 1000°F for 24 hr, air cooled.

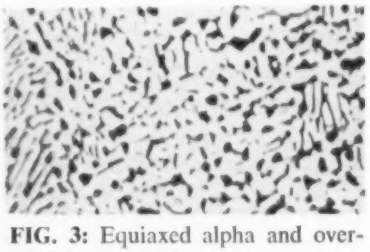


FIG. 3: Equiaxed alpha and overaged beta (dark). Heat treatment: 1500°F for 1 hr, water quenched; 1000°F for 24 hr, air cooled.

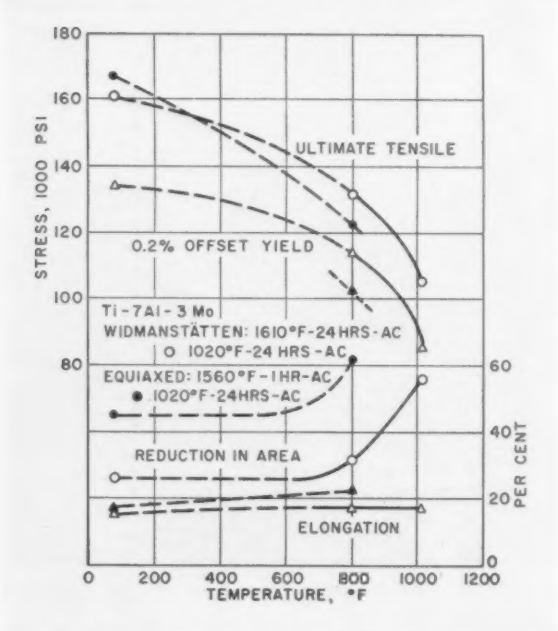


FIG. 4 (left): Tensile properties of Widmanstatten and equiaxed forms of the Ti-7Al-3Mo alloy at various elevated temperatures.

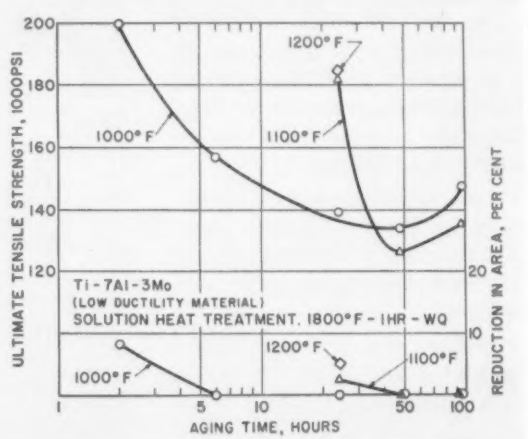


FIG. 5 (above): Effect of aging time on tensile properties of Ti-7Al-3Mo alloy when solution treated at 1800°F for 1 hr and water quenched.

at High Heat

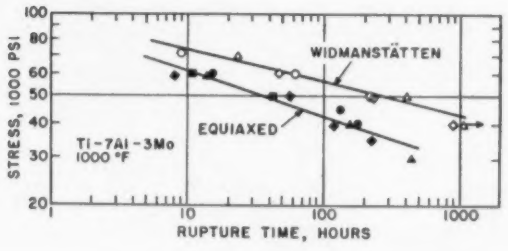


FIG. 6: In stress-rupture tests at 1000°F, the Widmanstatten form of the Ti-7Al-3Mo alloy shows up better than the equiaxed.

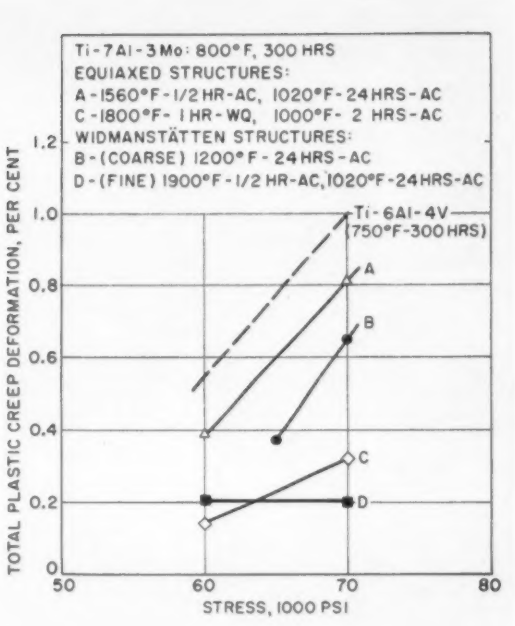


FIG. 7 (right): At 800°F and 70,000 psi stress, the Widmanstatten structure represented by curve "D" seems most resistant to creep.

aged beta, Fig. 3. (Beta is the light-etching phase in Fig. 2 and the dark one in Fig. 3.) The relationship between heat treatment and properties is significantly different for the Widmanstatten and equiaxed structures.

More Creep Resistant — Essentially, the Widmanstatten structure is somewhat more creep resistant and has higher rupture strength than the equiaxed structure. These features might make it desirable for some uses.

At room temperature, Widmanstatten-structure specimens — solution treated, aged and having 10 pct or more elongation—show ultimate tensile strengths ranging from 144,000 to 170,000 psi. Yield strengths (0.2 pct offset) for these specimens range between 128,000 and 146,000 psi. Fig. 4 shows the tensile properties of both structural types plotted over a range of temperatures.

Ductility in Widmanstatten structures is improved by making the alpha plates thicker and more continuous. One way to do this is by solution treating at a relatively high temperature below the beta transus for a relatively long time. The alloy should then be aged at about 1000°F to increase its strength and stability.

The highest ductility values reported for a solution treated and aged Widmanstatten structure are 16 pct elongation and 41 pct reduction in area, with a tensile strength of 170,000 psi. These figures were obtained from a rod extruded at 1850°F, solution treated at 1560°F for one hour and air cooled, then aged at 1020°F for 24 hours and air cooled.

Signs of Instability—For solution heat treated and aged equiaxed structures that show 10 pct elongation or more, ultimate tensile strength ranges from 154,000 to 202,000 psi. Yield strength with this structure falls between 136,000 and 177,000 psi. However, there is some evidence that the structural condition produced by this heat treatment is relatively unstable.

Fig. 5 plots the alloy's tensile strength and reduction in area against aging time at temperatures of 1000° and 1100°F. Before aging, specimens were solution treated at 1800°F for one hour and water quenched. The graph shows that, while there is some ductility after aging at 1000°F for two hours, none is apparent after six hours of aging.

The light-beta-phase microstructure of Fig. 2 was produced by aging at 1000°F for 24 hours. Aging for 96 hours at either 1000° or 1100°F does not restore ductility (although fracture stress is increased), and the microstructures of such specimens continue to show the light-appearing beta.

Watch Light Beta — Thus, heat treatments which produce a light-etching beta must be evaluated carefully for alloy stability under the expected conditions of use. Further aging of such structures might cause embrittlement.

Water quenching from 1500° or 1600°F and aging at 1000°F for 24 hours produces the dark-etching beta phase of Fig. 3. Since the light beta results from 24-hour aging after an 1800°F solution treatment, it must be more sluggish thermally than the beta formed at 1500° to 1600°F.

Fig. 6 plots stress-rupture data at 1000°F to show the significant difference between Widmanstatten and equiaxed microstructures.

Structure Affects Creep—Fig. 7 shows 800°F creep data for both types of structures. Under 70,000

Stability Data for Ti-7A1-3 Mo Alloy

Heat Treatment	Structure*	Exposure Conditions				Tensile Properties					
						Before Exposure			After Exposure		
		Temp. °F	Stress, psi	Time, Hr	Def. %	UTS, psi	RA %	El %	UTS, psi	RA %	El %
1560°F-½ hr-AC, 1020°F-24 hr-AC	E	800	70,000 60,000	300 300	0.81 0.39	170,000 170,000	49.0 49.0	16.0 16.0	178,000 164,000	46.0 34.0	18.0 19.0
1900°F-½ hr-AC 1020°F-24 hr-AC	W	800	70,000 60,000	300 300	0.20 0.21				157,000 159,000	8.0 10.0	4.0 8.0
1800°F-1 hr-WQ, 1000°F-2 hr-AC	E	800	70,000 60,000	300 300	0.32 0.14	211,000 211,000	11.5 11.5	6.0 6.0	172,000 166,000	0.0 0.0	0.0 0.0
1610°F-24 hr-WQ, 1020°F-48 hrs-AC	W	1020	20,000	1000	∠0.5	161,000	26.0	15.0	159,000	28.0	15.0
1610°F-24 hr-AC, 1020°F-24 hr-AC	W	800	80,000	330		160,000	13.0	9.5	162,000	13.0	8.0
1610°F-24 hr-WQ, 1200°F-48 hr-AC	W	1200	6,000	1000	1.0				138,000	15.0	11.0

*E—equiaxed, W—Widmanstatten.

psi stress, a medium-strength, fine Widmanstatten structure ("D") appears most resistant to creep. The least amount of creep resistance is shown by curve "A," representing a medium strength equiaxed structure. Curves "B" and "C" indicate a low strength Widmanstatten structure and a high strength equiaxed structure, respectively.

The creep data of Fig. 7 also indicate that the various structures might show different results at 50,000 psi stress. For further comparison, the same graph includes creep data at 750°F for the Ti-6Al-4V alloy. Under the same stresses, the 7Al-3Mo alloy shows greater creep resistance at 800°F than the 6Al-4V alloy at 750°F.

Stability tests are summarized on this page. They show that solution treating a Widmanstatten structure at 1560°F for ½ hour followed by air cooling, plus a 24-hour aging at 1020°F followed by air cooling, definitely produces structures which are stable after 300 hours of stress exposure at 800°F.

Upper Limit Sought—The high strength heat treatment applied to equiaxed material—1800°F for one hour with a water quench, plus 1020°F aging for 2 hours followed by air cooling—definitely produces unstable structures after 300 hours of exposure to stress at 800°F. The upper temperature limit of structural stability after this high strength heat treatment is still to be determined. It is not likely to be lower than 300°F, but further testing will establish this point.

Room temperature fatigue data for the 7Al-3Mo alloy are summarized in Fig. 8. The K = 1.8 notched endurance limit seems to be between 43,000 and 47,000 psi. The average endurance limit for seventh-stage compressor blades on the J-57 jet engine is 76,000 psi. This compares with 70,000 psi for blades made from the Ti-6Al-4W alloy.

Several companies have made pilot evaluations of the 7Al-3Mo alloy for specific purposes. These tests show that the material can be fabricated to useful shapes. For example, if current bench tests of compressor blades prove successful, a full engine evaluation of these parts is sure to follow.

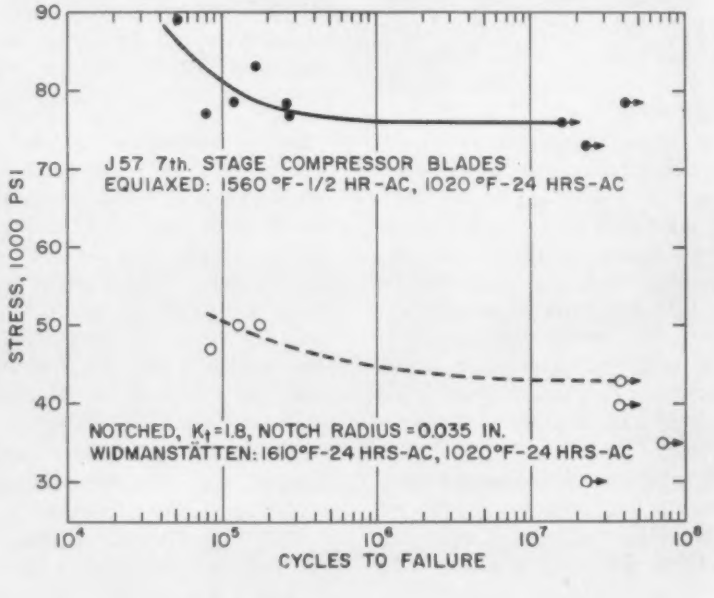


FIG. 8: Results of room temperature fatigue tests for notched specimens and compressor blades, both made from the Ti-7Al-3Mo alloy.

WELDING IN ACTION: Fast manual welder takes 3 seconds per weld. Template helps locate welding points.

Spot Welds Simplify Sheet Assembly

Even such an effective joining method as welding has limitations. Such is the case where welding heat distorts sheet metal.

But a proper choice of welding method solves this problem.

Spot welding does the job for one company and adds the benefit of joining where screws were necessary before.

▪ Continuous welding tended to cause warpage in the fabrication of wall units of caboose cars at the International Railway Car Co., Kenton, O. It brought about the choice of spot welding for the job.

In replacing continuous welding, Air Reduction Co.'s Aircomatic inert-gas-shielded metal arc process was adapted with a nozzle and timing device. It makes 456 spot welds on each caboose.

Seven sheets of 14-gage copper-bearing mild steel, placed side by side, make up the inside lining on each side. The sheets are butted together over "z" bars.

Spot welds are made on the seams 6 in. apart for a total of 14 welds per seam. The top section is welded across with welds 6 in. apart. Along the bottom section the welds are 12 in. apart.

Welds Displace Screws — Spot welds displace a drilling operation and the use of metal screws on the stiffeners. The latter are deep channels formed of 14-gage steel.

Each weld, taking 3 seconds, uses 3 in. of 1/16-in. A-675 wire. Argon gas plus 3 pct oxygen shields the process.

Templates made of plywood with holes drilled at proper intervals help obtain uniform spacing of welds. They also serve to hold the sheets down during the welding operation.

Power Brushes Take On Maintenance Job

By E. P. Fisher—Project Engineer, The Osborn Mfg. Co., Cleveland

There's no doubt conveyors save in handling costs. But what about maintenance?

Some materials stick to belts and cause destructive wear with downtime and manhours spent in frequent cleaning.

What's needed is effective cleaning on a continuous basis.

▪ Rubber and fabric conveyors have simplified materials handling by reducing direct labor to a minimum. But the maintenance departments of conveyorized plants must cope with the problem caused by carry-over of bulk materials such as sand, coke, and ores.

Carry-over is the residue adhering after the belt has passed over the header roll. It sticks to the snubber roll and often on the idler rolls. Build-up on the snubber roll causes excessive wear of the belt and poor trim, with resultant lower belt speeds. Carry-over drops to the floor; it causes dust, affecting other equipment in the area.

Several devices have been tried to prevent carry-over at its source. For instance, rubber or steel scrapers can be mounted on the return side of the belt.

Scrapers have several drawbacks. First, they do not completely remove carry-over. Then they wear quickly and can damage the belt. A spliced or repaired belt can catch the scraper, causing eventual breakdown.

In another technique, rotating steel flappers vibrate the belt on its

HIDDEN CHORES: Despite efficiency of conveyor handling, there's a maintenance headache in controlling carry-over.

SELF-CLEARING: Each strip brush flexes to keep free of carry-over. Helical sweeping action cleans belt surface.

return trip to shake the material off. This approach only minimizes severe cases of carry-over.

Design for the Job—A new power brush solves a problem which has limited use of brushes in the past. Rotary brushes tend to pile up and become loaded with carry-over.

The new brush developed by The Osborn Mfg. Co., Cleveland, cleans with a series of heavy duty strip-type brushes arranged helically. The interrupted face allows each strip brush to flex and clean itself. It's effective because of the sweeping action, differing from the whirling action of rotary brushes.

The brushing unit, called Rota-Master, comes in varying widths—16, 18, and 25 in.—and adapts to numerous belt sizes by being ganged together. Refilling the units takes no special techniques. Synthetic brush materials such as Osborn's "Korfil" or Dupont's "Tynex" last for a year or more on many belt applications.

For Foundry Sand—A frequent use is in automatic foundries. Carry-over causes lumps in core sand, resulting in poor cores. The brushing setup eliminates such carry-over.

Another good application is on coke conveying belts. In one plant the brushing unit saves 1½ hours of labor per day that used to be spent manually cleaning the belt. It also frees a man from having to shovel carry-over into a hopper.

In a chemical plant conveying wet alkaline mixture, the rolls had to be cleaned twice weekly. The brushing setup reduces maintenance to a quick cleaning once a month.

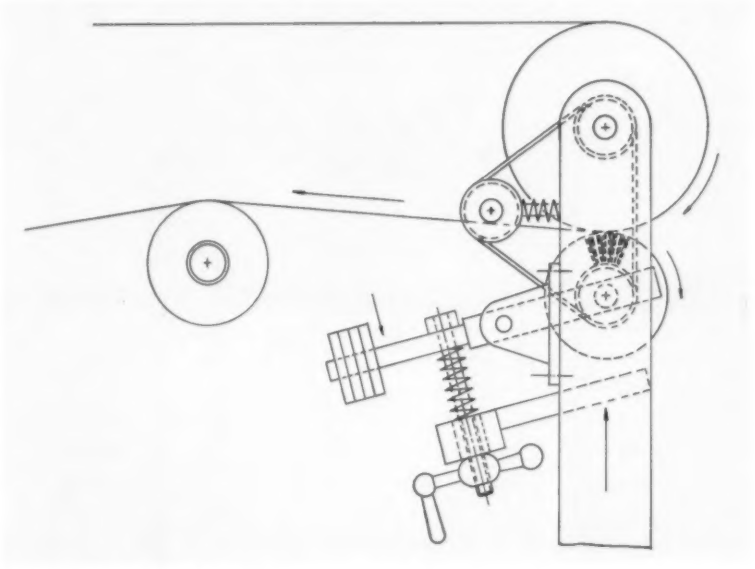
Where to Mount—The preferred location is immediately after the conveyor has dropped its load. Usually, it's a short distance from the driving roll and ahead of the snubber or take-up roll.

Installation depends on the conveyor, frame and location of rolls. A low cost method for obtaining control of brushing pressure without frequent inspection uses a counterweight to keep brush and belt in contact.

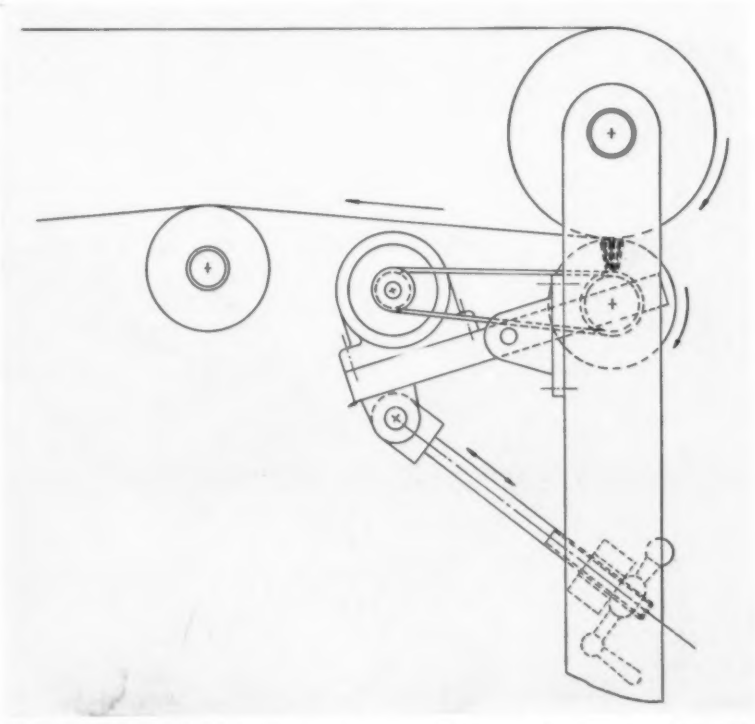
A dampening spring maintains uniform brushing of the belt surface. As the brush wears, the counterweight automatically compensates.

Belts from the header roll can drive the unit. If a separate motor drives the brush, the motor is wired so that it will cut off when the conveyor is stopped.

When material is quite tacky and frequent inspection of the brush and belt can be made, a screw arrangement instead of the counterweight insures positive pressure control.



LOW-COST CONTROL: Counterweight keeps brush in contact with belt. Dampening spring insures even pressure. Header roll supplies power.



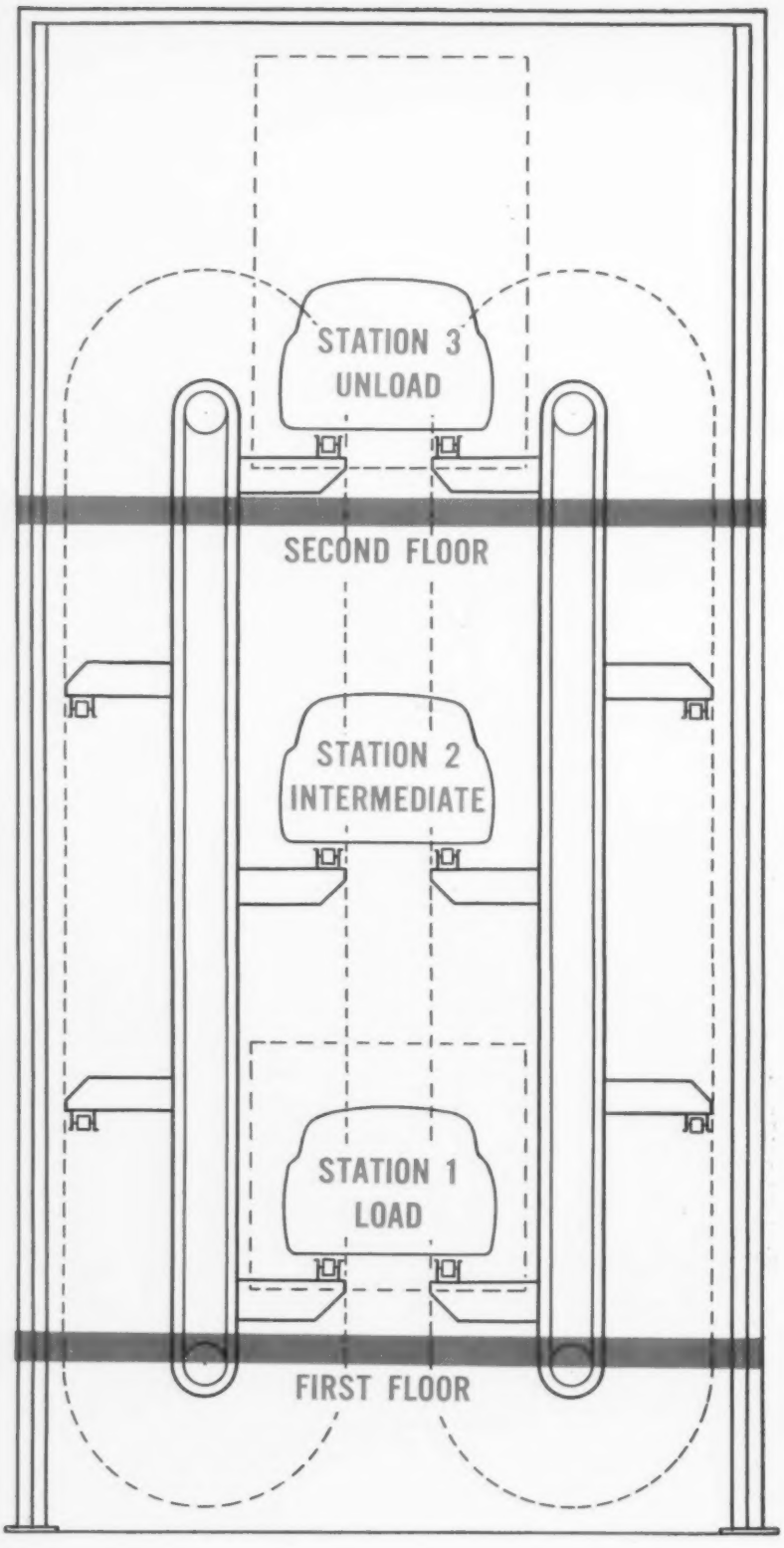
POSITIVE PRESSURE: For tacky materials manual screw tension gets positive pressure control. Separate motor drives brush.

Vertical Lift

Just because an ungainly assembly weighs ¾ ton or more doesn't mean you can't automate its transfer.

But what about lifting units from one floor to the next?

One company solves this automation problem with a conveyor designed for the job.



SCHEMATIC LAYOUT: Lift arms attach to continuous chain. Station 1 loads while station 3 unloads at same time.

▪Modern plant layout often calls for segregation of paint spraying operations. Plant engineers wanted to use this principle in the new Lincoln assembly facility, Wixom, Mich. To do this their best bet seemed to be a second floor devoted only to priming, painting and related operations.

The new unitized body construction, however, creates a materials handling problem. To maintain a smooth flow of production, the assembly line needs a swift and positive elevator to transfer bodies in minimum possible area.

Integrated Lift—The answer, devised by Conveyor Engineering Co., Detroit, is an installation consisting of a three-station body lift at one end and lowering unit at the other. In designing the system they gave special consideration to such factors as: 1. operational distance between floors; 2. weight per unit body; 3. maximum rate of flow at points of contact with the production line; 4. ease of integration with the other conveyor systems.

Although the conveyors have a maximum speed of 33 fpm, actual operating rates are determined by demands at the point of destination. The body lift zone extends from below the first floor to the top of the second, a total of 46 ft. There's ample space to house the lifting mechanism.

The unit lifts two 1600-lb bodies simultaneously. Operation is automatic once the cycle begins. Inter-

Automates Transfer of Large Units

locks prevent start of the cycle unless both doors on the second floor are clear and a body is loaded and doors closed on the first floor.

There are three stations: a loading station on the first floor, an intermediate between floors, and an unloading station on the second floor.

How It Works — An electric transfer car feeds an unpainted body into the lift on skids, with a limit switch opening the metal safety doors. An auxiliary electric loader positions the body inside. The doors close through action of another limit switch.

Next the body moves up to the intermediate station. Here it's held while station 1 is loaded and station 3 unloaded. The intermediate station serves to cut cycling time. It also gives added capacity to meet hourly production schedules.

At the third station, limit switches open the doors. An electric pusher moves the body skid over rollers onto a conveyor table. The body goes through two 90° transfers and then to the painting line on an overhead conveyor.

After painting the body reaches the opposite end of the floor, ready for transfer to the final assembly line. The lowering unit also operates on a three-station sequence. A power-roll table, an electric pusher, and limit switches make loading and unloading automatic. Only the electric cars require operators to move the body into place on the production line.

Built-In Safety—For both safety and flexibility, controls are incorporated to allow manual operation. They cover operation of the safety doors as well as the lifting and lowering mechanisms.

The installation includes automatic fire doors. In addition the entire structure is enclosed with insulated sheet-metal panels. The shafts can be completely sealed to give the safety of isolation for the second floor paint facilities.

AUTOMATIC LOADING: Unpainted body on skid moves into lift for transfer to paint line on floor above.

Why Metallurgy of Iron Shot is

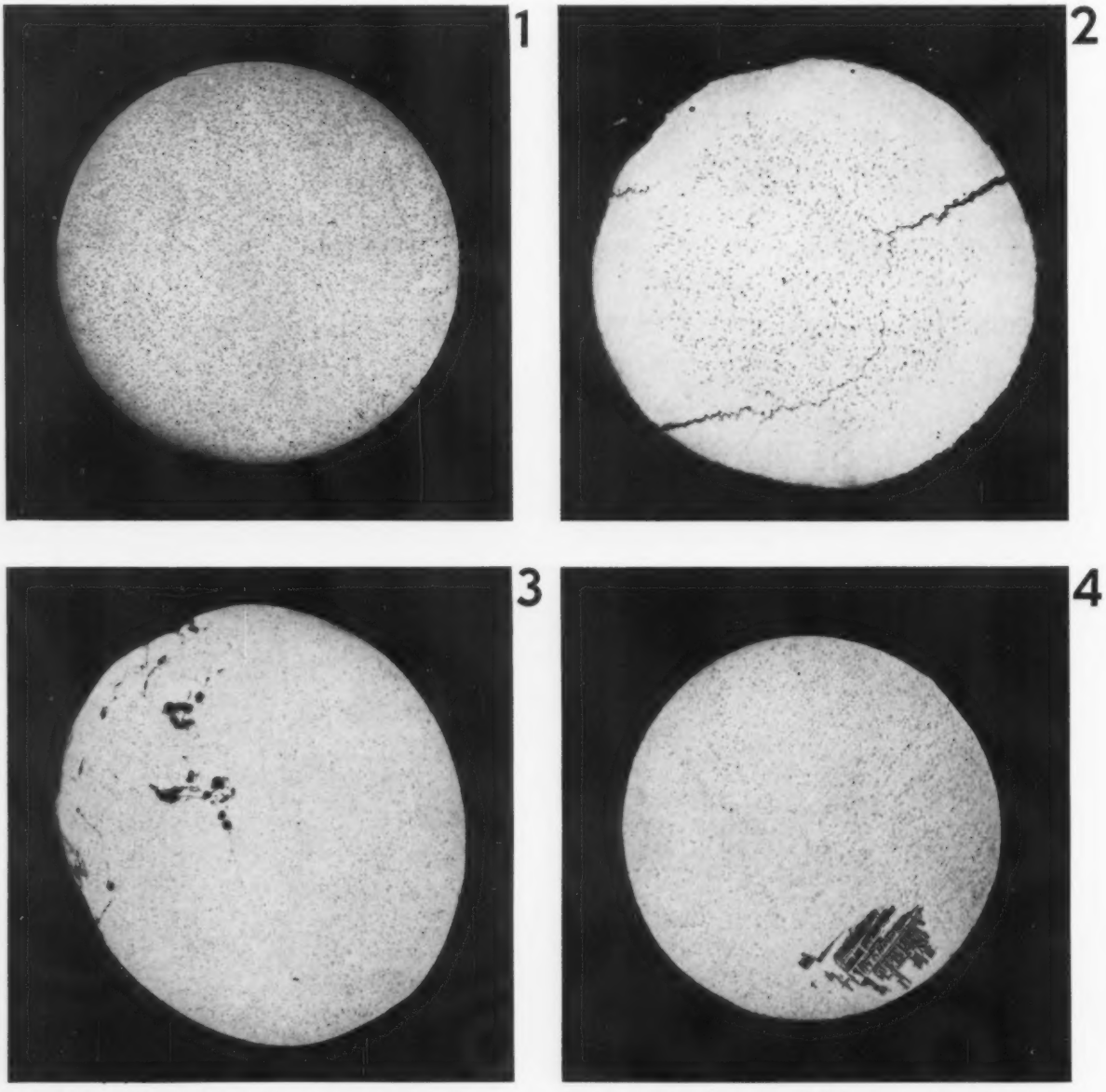
Malleable iron shot used for cleaning and peening is most often taken for granted.

But the quality of shot depends on a number of metallurgical variables which determine its performance.

▪ Malleable iron shot has been used for metal cleaning and peening for at least 30 years. Over this period, its use has been extended to the point where it is no longer a novelty—even in smaller manufacturing plants.

This is as it should be. Still, the unusual versatility of iron shot should not be overlooked simply because the material is a familiar one.

In its initial, unrefined condition, malleable iron shot is nothing more or less than white iron. But to



FOUR CONDITIONS: Satisfactory shot (1) is almost perfectly round and sound throughout. Quench cracks (2) and gas holes (3) are common defects of improperly prepared shot. A shrinkage cavity shows up prominently in another defective specimen (4). These are some of the features that determine shot quality.

Important

By A. M. Hall—Chief,
Alloy Development Div., Battelle Memorial Institute,
Columbus, O.

obtain desired properties, it must be malleabilized.

Severely Abrasive — One such property is good abrasion resistance. Shot is exposed to severely abrasive conditions in service. The dynamic contacts between the shot and the components of the blasting machine, between the shot and the work, and between the shot particles themselves, provide many opportunities for abrasion.

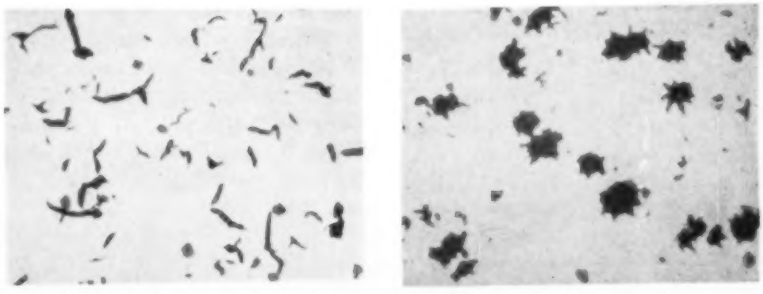
Abrasion of shot tends to reduce its size. And as shot particle size is reduced, its momentum is also reduced, and so is the amount of work it can do when it strikes the workpiece.

This does not mean that large shot should always be used. An important reason for limiting shot size is to gain the desired amount of "coverage" of the work. The optimum amount of coverage varies from job to job.

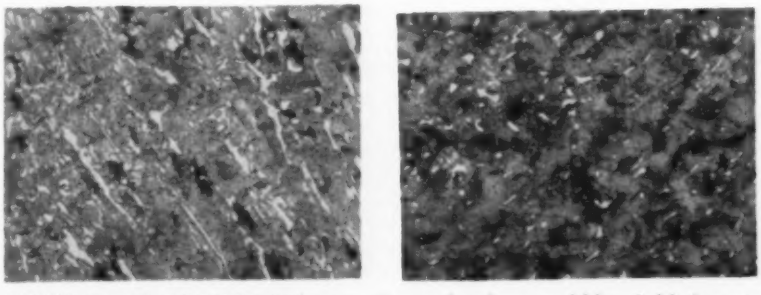
Vital Toughness—The true significance of abrasion resistance is in maintenance of a desired particle size, and prevention of rapid wearing of shot into sizes too small to be useful for the particular application.

Toughness is a vital property which strongly influences the behavior of shot in service. It is a qualitative measure of the capability of the shot to withstand repeated impacts without fracturing. A very high toughness is frequently undesirable. For many scale-removal operations, a certain amount of fracturing of the shot during use is advantageous.

Cleaning and Peening—Fracturing provides the particles of shot with sharp edges and corners which facilitate the cutting and flaking of certain types of scale, especially subscales. On the other hand, for peening operations a high degree of toughness is required. Sharp-edged particles are to be avoided.



FLAKE FORMATION: Left photomicrograph shows a stringer-type formation of graphite flakes which is undesirable. At right: the preferred compact graphite formation essential to satisfactory peening performance. Magnification of both photomicrographs is 1000X.



BRITTLE VS. TOUGH: Stringers of massive iron carbides (white) seen in the left micro are sufficiently numerous to cause serious brittleness. Right: massive iron carbides (white particles) are properly distributed. There are enough of these carbides present to promote toughness and abrasion resistance. Magnification: 500X.

The objective in peening is to hammer the surface of the work, not to penetrate it.

Another key property is resistance to deformation. In terms of shot applications, this property may be defined as the yield point of the shot under conditions of impacting a workpiece. The importance of this property stems from its influence on the transmission of energy from the shot to the work during impact.

In scale removal, the shot must transmit enough energy to the scale to exceed the breaking strength of the scale. The scale is then fractured, and the fractured pieces of scale are propelled away.

Cut Losses—In peening, the shot must transmit sufficient energy so that the flow stress, or yield point, of the work is exceeded and the surface of the work is caused to deform. In the transmission of energy on impact, certain losses are inevitable. For optimum efficiency, it is desirable to keep such losses to a minimum.

This means that the yield strength of the shot must be sufficiently high that very little, and preferably no, plastic deformation of the shot occurs during impact.

The properties of abrasion resistance, toughness, and resistance to deformation are often gaged in terms of hardness. Such a criterion for these properties can be misleading. Hardness is frequently not re-

What microstructure is best depends on application

lated in a mathematically continuous manner to the other properties, as it would have to be if it were to be an accurate measure of them.

Product Uniformity — On the other hand, use of the hardness test serves a very important function in shot manufacture. It is a convenient and effective means of controlling production operations and maintaining uniformity of product.

The properties of malleable iron shot depend entirely upon the chemistry, the macrostructure and the microstructure of the material. All of these factors can be controlled. Chemistry is important because it determines, to a large extent, the limits within which the mechanical properties of the shot can be varied.

Macrostructure and microstructure determine what the actual properties will be, within these limits. These two factors constitute the metallography of malleable iron shot. They have a complex influence and offer the basis for explaining shot performance and rationalizing the properties shot should possess for satisfactory performance under given conditions.

Properly Shotted—An obviously desirable characteristic of shot is roundness. If the molten iron is properly shotted, round particles will be formed. Roundness facilitates handling both in production and use. It promotes resistance to fracturing on impact.

Another macrostructural characteristic of critical importance is the soundness of the shot. Unsound shot fractures far more readily during impact than does sound shot. The influence of soundness is akin to that of toughness.

In terms of production economics, the high carbon content of the iron from which shot is made is a distinct advantage. For the addition of carbon substantially lowers the melting point of iron. On the other hand, the graphite or temper carbon necessarily formed in the material when it is malleabilized can be detrimental in terms of performance of the shot. When the graphite is unevenly distributed in the particles of shot, it can decrease resistance to fracture.

Graphite Important — If the graphite assumes the form of irregularly shaped flakes, the resistance of the shot to fracture upon impacting the work is severely reduced. The interfaces between the graphite flakes and the matrix constitute planes of weakness. The ends of the flakes act as stress raisers during impact. Uniform distribution of graphite is desired, while the compact type of formation is much to be preferred over the flake type.

Dominant influence on shot performance is exerted by the matrix. This has a complex microstructure subject to considerable variation. The composition and microstructure of the matrix determine the yield strength, or resistance to deformation of the shot.

These two factors also exert a strong influence on the abrasion resistance of the shot. Finally, the composition and microstructure of the matrix, together with the soundness of the shot and the form and distribution of the graphite, control the toughness or resistance to fracture on impact.

Ferrite Deforms—Ferrite is very tough but has a low yield strength. If the shot matrix were ferrite or largely ferrite, the shot particles would be expected to resist fracture. But they would also suffer considerable deformation on impact. This would impair their ability to clean or peen satisfactorily.

Decarburization, resulting from improper heat-treating conditions, converts the outer layers of shot into ferrite. Deep or shallow, such a ferritic layer is to be avoided.

A satisfactory matrix is high in carbon content, containing perhaps 0.80 pct carbon. The carbon content of the matrix is that which remains after graphite formation during the malleabilizing treatment minus the excess carbides in the microstructure. The matrix is essentially a high-carbon steel. As such, it may possess a wide variety of microstructures with a wide range of mechanical properties.

Choose Compromise — Pearlite has more yield strength and hardness then ferrite, but is not as tough. Bainite has still greater hardness and yield strength with less toughness. Martensite has maximum hardness and strength but is comparatively brittle, especially when the carbon content is high. Each type of matrix microstructure imparts characteristic properties.

In terms of short usage, the properties tend to be mutually incompatible. Consequently, it is good practice to arrive at a compromise in microstructure. This results in a compromise in properties. The compromise point differs depending on the intended application of the shot.

The final microstructural factor influencing the properties is the amount and distribution of massive iron carbides in the material. These carbides are hard and brittle. They occur as networks in the as-shotted (chilled) iron.

Control Carbides—Such carbide networks are largely responsible for the brittleness of chilled iron. The malleabilizing treatment removes most of the massive carbides and replaces them with graphite. Not all carbides are removed. The presence of a certain percentage of carbides helps to improve abrasion resistance.

If remnants of the networks remain, they will promote brittleness. This means that the degree to which the massive carbides are removed by malleabilizing must be controlled in the production of high-quality shot.

DELIVERY WHEN YOU WANT IT from...

Acme-Newport Steel

● RED CIRCLE SERVICE

RED CIRCLE SERVICE

For those who cut their inventories until it hurts, Acme-Newport has inaugurated Red Circle Service, a specially conducted mill tour for spot orders. A bright red circle is placed on every rush order to alert all departments to give preferential attention right through to rail, truck or barge. Red Circle Service combines the flexibility of operation of a mill this size, with Acme-Newport's modern facilities and 73 years' experience. You get high-quality steel to your specification . . . *and you get it when you want it.* Enlist Red Circle Service in your program of inventory control!

PRODUCTS OF
ACME-NEWPORT STEEL

HOT ROLLED STEEL IN COIL
HOT ROLLED PICKLED STEEL IN COIL
HOT ROLLED SHEETS
HOT ROLLED PICKLED SHEETS
COLD ROLLED STEEL IN COIL (*Full Hard only*)
COLD ROLLED SHEETS
ALLOY SHEETS AND PLATES
PLATES (5/16" *and lighter*)
ELECTRIC WELD LINE PIPE

Acme-Newport Steel COMPANY
NEWPORT, KENTUCKY
A SUBSIDIARY OF ACME STEEL COMPANY

Tool Change Brings Surprise Savings

One firm figured it would cut costs by machining a swarf contour on two parts at the same time. It did save on this, of course.

But, in redesigning its tooling setup, it unexpectedly ran into even more savings.

▪ Machining the same swarf contour simultaneously on two SAE 4130 steel parts presented a tooling problem to a firm's engineers. Redesigning its tooling setup solved it, though. Not only this, it delivered some unexpected cost savings, too.

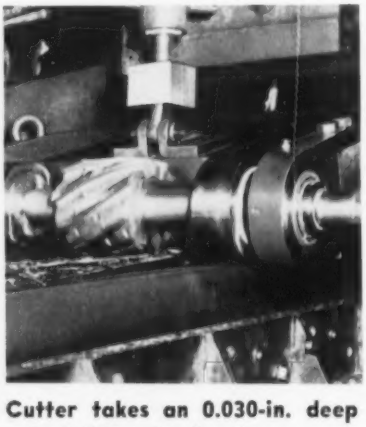
Credit for the accomplishment goes to some tool design changes and a special milling cutter gang for machining the contour.

To work the contour, engineers of the company, Chance Vought Aircraft, Inc., Dallas, proposed adaption of a standard Cincinnati horizontal Hydro-Tel. They designed a special head and auxiliary equipment to permit close control over table rise and fall and changes of angles encountered in machining the parts. Templates of the contour to be reproduced act as the guide.

Call Outside Help—For the special milling cutter gang the firm called on Goddard & Goddard Co., Detroit. This tooling organization recommended that guide bearings, which pilot the gang over contour templates, be changed from conventional to a design developed by Briney Mfg. Co., Pontiac, Mich. Adopting this proposal saved an initial $700, the company figures.

In operation, the outer race of the bearing rolls on and travels over the templates while the cutter takes a 0.030-in. depth of cut at a 4-ipm feed with a surface speed of 280 fpm (133 rpm). The inner race of the bearing is keyed to the cutter arbor. Therefore it turns at the cutter rpm. The outer race, of course, turns only at the feed rate.

Use Carbide Tips — To obtain high feeds and speeds, the cutters employ true helical inserted carbide-tip blades. Mating serrations in the blade back and cutter body plus a screw-actuated wedge secure the blades in place. The helical de-



Cutter takes an 0.030-in. deep cut at 4-ipm feed rate.

Want More Data?

You may secure additional information on any item briefed in this section by using the reply card on page 100. Just indicate the page on which it appears. Be sure to note exactly the information wanted.

sign permits a progressive tooth entry into the work.

Carbide tips are brazed on a true helix to the blade shank. Adequate backing absorbs shock that could fracture the carbide.

Marking System Cures Lube Headaches

If you want to speed up and simplify lubrication operations, maybe a hint from Reynolds Ink, Inc., Cleveland, will come in handy. The idea is this: using different colored stencil inks in spray cans, mark your lube equipment with different colors (the firm's ink comes in nine colors).

A color can be chosen for identifying a particular kind of grease. The drum or other type container is marked with this color. Also, the same mark is applied to the gun, pump or loader. This same color is applied to bearing points on machinery. The required frequency of lubrication may be indicated by the size or shape of the mark.

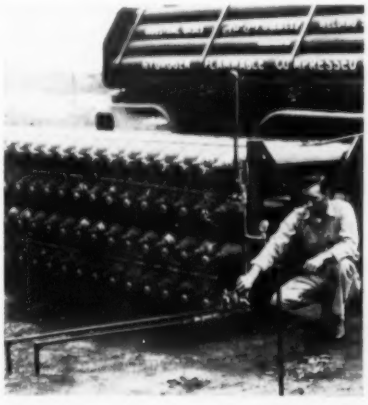
Such a system can eliminate using the wrong lubricant. It can do away with misapplication. Stencil inks are oil and weather-proof, but lacquer thinner or alcohol will readily remove them.

Stores Gas Outdoors

Recent installation of a bulk high purity hydrogen-storage system at Superior Tube Co., Norristown, Pa., eliminates virtually all manual handling of individual hydrogen cylinders.

Now the hydrogen is stored outside the plant in a central location. It's piped underground into the plant for use in controlled atmosphere annealing furnaces and for blowing out small-bore tubing.

Assures Ample Supply—Hydrogen, which is 99.9+ pure, is supplied where needed inside the plant simply by turning a valve in the pipe line system, rather than trundling in single cylinders. This is not only an efficient way of handling; it also assures an ample supply of gas the instant it is needed, wherever needed.



Permanent gas racks and tank truck in rear act as a team.

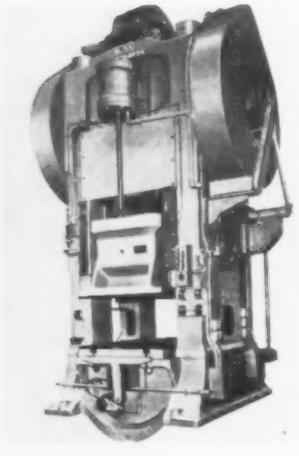
The storage system, devised in cooperation with Air Products, Inc., Allentown, Pa., consists of specially constructed tube trailers. Each holds 38 long tubes of compressed hydrogen. Next to these is a permanent rack of 152 standard size cylinders. These, too, are filled with compressed hydrogen.

Copper-plates Rapidly

A new acid copper plating process gives fast, smooth, ductile deposits. Developed by Sel-Rex Corp., Nutley, N. J. the Process consists of two simple addition agents. These may "convert" existing sulphate or fluoroborate copper plating baths, or they can make-up original baths.

New Production Ideas

Equipment, Methods and Services



Mechanical Press Coins Large Size Parts

With a 48 x 84-in. bed, this mechanical double knuckle joint press performs multiple coining operations. Or it can coin extremely large size items. Or it may coin widely separated parts in the same operation. Making all these possible is its double knuckle arrangement, one in front and one in back. This setup gives uniform two-point ram pressure for heavy tonnage jobs. Featuring a 1000-ton capacity, the press makes use of a nine station front-to-back transfer feed on 9-in. centers. The feed bar centers adjust right to left. Provision is made for two feed lines using four bars for coining small parts. The knuckle assemblies break inward toward each other; they are actuated by links from a slide mounted between them. The stroke of the ram is 8 in., with a motorized adjustment of ½ in. Of straight side design, the press features four-piece steel tierod construction. (E. W. Bliss Co.)

For more data circle No. 41 on postcard, p. 100

Automatic Machine Handles Complex Bar Jobs

Powered by a 25-hp motor, this bar machine production works complex, precision bar jobs on a fast, automatic basis. It employs an automatic hydraulically operated collet chuck and bar feed of 3-in. diam capacity. Bar feed stroke is infinitely variable from ⅛ to 10 in. A restocking indicator shuts down the machine tool before the bar runs out. This prevents cutting tool damage from improperly gripped stock. Its motor is reversible for threading operations. During the machining cycle, the bar machine self-selects spindle speeds, feed changes, cutting stroke length, turret indexing, and both front and rear cross slide operation. An independently operated cutoff slide driven by the spindle handles cutoff. This has a separate 0.0015 to 0.020-in. feed selection. (Warner & Swasey Co.)

For more data circle No. 42 on postcard, p. 100

Giant Fork Truck Lifts 22-ton Loads Easily

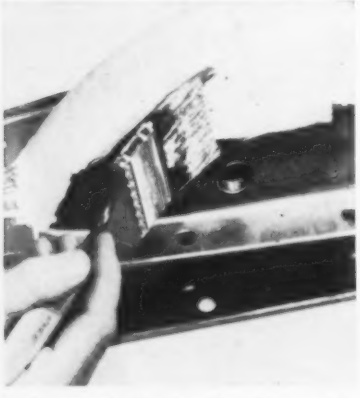
Using a unique steel-finger setup, this giant fork truck lifts 22-ton loads easily and delicately. It operates over extremely rough terrain, carrying many types of materials—from steel structurals to pre-cast concrete items. To prove its versatility, the handler makes use of forks, cranes, ram, forks and tusks, or forks and jointed tusks. Resembling the maker's earlier wooden - log handlers, the unit adapts to many jobs involving big, heavy loads. It differs from log carriers since it has an electrically-powered "joint" near the center of its tusks. This makes the tusks function like two powerful steel fingers. Such a knuckle-like arrangement makes possible handling heavy loads of various materials with precision. Because the unit is all - electric powered, there aren't any clutches or other mechanical drive mechanisms. (R. G. LeTourneau, Inc.)

For more data circle No. 43 on postcard, p. 100

NEW EQUIPMENT

Parting Compound

A stop-off material acts as a parting compound to prevent brazing of not-to-be-brazed mating surfaces during furnace operations. Supplied in powder form, the material mixes



with a volatile plastic. In certain brazed assemblies, it's important that some faces or portions of faces of mating components be left free of one another. This stop-off compound prevents brazing or fusion of any surfaces to which it is applied. When mixed with cement to the proper consistency, it can be applied by brushing, dipping or spraying. Residue following brazing is easily removed by air-blasting or brushing. (Wall Colmonoy Corp.)

For more data circle No. 44 on postcard, p. 100

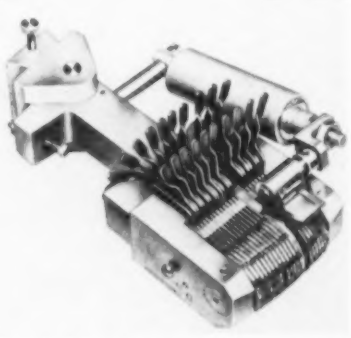
Galvanized Wire

For use in manufactured goods which require a bright, shiny wire finish, a new Belgian extra bright galvanized wire is available. It comes in ASWG sizes from No. 000 to 20 gage. (M. Paquet & Co.)

For more data circle No. 45 on postcard, p. 100

Numbering Head

A producer of metal marking and numbering equipment has announced a new type automatic numbering head. It combines five unique features for roll marking a 20-digit number into flat workpieces with a permanent indented impression in a curved line. The head is used in a general purpose roll marking machine. Basically automatic in operation, it indexes after each roll marking stroke to give consecutive serial numbering. Rather than the usual cam or lever arrangement this indexing is accomplished by a small



1⅛-in. bore air cylinder operated directly from the marking machine cycle. In addition to the automatic operation, the head is equipped with 20 indexing levers, in two banks, for manual indexing of all wheels in-

cluding those wheels which are also indexed automatically by the air tripper. The rocker-style unit features a barrel-shaped wheel assembly for roll marking on flat surfaces. Its head pivots on the dovetail shank pivot pin during the roll marking stroke. The head is also unique in that engraving on each wheel is off center so that the roll marked impression is on a curve or radius. (Noble & Westbrook Mfg. Co.)

For more data circle No. 46 on postcard, p. 100

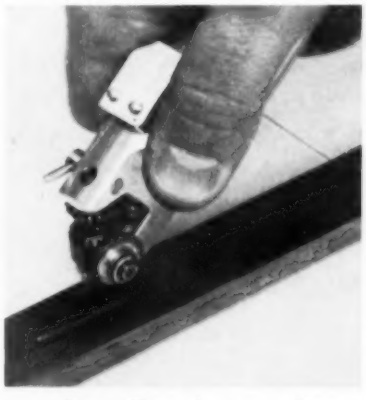
Tin, Lead Plating

Plating solutions recently developed allow tin and lead to be plated singly, or in combination, in any proportion of value to the user. High-lead-current alloys (93 pct) are suitable for bearing applications; 60-40 tin-lead alloys are ideal for components requiring subsequent soldering. Both new solutions are slightly alkaline, the tin having a pH of about 7.5, the lead ranging between 8.0 and 8.5. They will not set up corrosion cells, will not cause embrittlement, and do not attack different neighboring metals, says their developer. (Dalic Metachemical, Ltd.)

For more data circle No. 47 on postcard, p. 100

Spot Welding Device

This roll-type ectrode unit is a new lightweight device which simplifies and automates spot welding



operations. Featuring a self-contained motor, it powers a welding wheel over the surface to be welded. Simultaneously a condenser discharge spot welder is automatically triggered. The rolling ectrode device is compatible with existing condenser discharge type spot welders. Typical installations: attachment of weldable strain gages, thermocouples, thermistors, lead out wires, etc. where adverse environmental conditions, such as shock, extreme temperatures, and high wind velocities exist. (Micro-Test, Inc.)

For more data circle No. 48 on postcard, p. 100

Tungsten

Because of its high solubility or fast reduction, a self-reducing tungsten alloy is used to best advantage after the original charge. Two to three pct of this alloy can be added for adjustments after a control preliminary without loss of furnace time. Up to 2 pct tungsten may be added to the melt within 30 minutes of tapping time, without danger of the tungsten settling on the bottom. (Strategic Metals Corp.)

For more data circle No. 49 on postcard, p. 100

New Catalogues And Bulletins

Money-saving products and services are described in the literature briefed here. For your copy just circle the number on the free postcard, p. 100.

Titanium Tube

The present status and future potential for titanium tubing is discussed in an 8-page publication. (Tubular Products Div., Babcock & Wilcox Co.)

For free copy circle No. 1 on postcard, p. 100

Press Welders

A 6-page bulletin deals with precision spot and projection press welders. It lists specifications for resistance welders from 30 to 600 kva, 1275 to 18,000-lb electrode forces, 12 to 30-in. throat depth. (Precision Welder and Flexopress Corp.)

For free copy circle No. 2 on postcard, p. 100

Tap Selection

"What Do You Mean, 'Specific' Taps?" is the title of a 20-page booklet. It tells how to get long tap life and better performance when tapping different materials. (Detroit Tap & Tool Co.)

For free copy circle No. 3 on postcard, p. 100

Extra-strong Steels

Extra-strength structural steels (yield strength over 200,000 psi) are described in a 16-page booklet. Published with the assistance of AISI, firms producing these steels, and several welding companies, it describes all ultra-strength grades available in the United States today. (Climax Molybdenum Co.)

For free copy circle No. 4 on postcard, p. 100

Chemicals

Characteristics, grades and containers for 24 basic chemicals are given in a 16-page booklet. It covers organic, inorganic and specialty chemicals. (Olin Mathieson Chemical Corp.)

For free copy circle No. 5 on postcard, p. 100

Towboats

A 4-page folder describes a new 3200-hp twin-screw diesel towboat. (Dravo Corp.)

For free copy circle No. 6 on postcard, p. 100

Materials Handling

How to reduce materials handling costs is told in a bulletin. It details advantages of overhead metal enclosed trolley busway electrification for cranes, hoists, stackers and other movable machines. (Feedrail Corp.)

For free copy circle No. 7 on postcard, p. 100

Grinding Wheels

Vitrified and resinoid grinding wheels are featured in a 16-page bulletin. These wheels are available in standard sizes and shapes or they can be engineered to meet specific requirements. (Simonds Worden White Co.)

For free copy circle No. 8 on postcard, p. 100

Analysis Unit

Described in a new data sheet is an instrument for use in spectrochemical laboratories. This unit analyzes solids, liquids and powders

—with elements in wide ranges of concentration (i.e., alloying constituents and impurities in metals, wear products and additives in lubricating oil). (Applied Research Laboratories.)

For free copy circle No. 9 on postcard, p. 100

Turret Drill

Automatic, hydraulic turret drills are featured in a dozen-page brochure. It contains nomenclature illustrations of 6- and 8-spindle models. (Burg Tool Mfg. Co.)

For free copy circle No. 10 on postcard, p. 100

Brazing Flux

Flux for high temperature brazing is introduced in a data sheet. (Wall Colmonoy Corp.)

For free copy circle No. 11 on postcard, p. 100

Size, Height Gages

Accurate precision gages for determining height and size are illustrated in a 4-page bulletin. The height-measuring instrument is portable, self-contained. Its companion gage is for production use where close dimensional checking is essential. (Pacific Gage, Inc., div. of Darco Industries, Inc.)

For free copy circle No. 12 on postcard, p. 100

Air-moving Equipment

A 6-page leaflet details a trade group's program to help users of air moving equipment. It tells how to quickly identify air moving equipment certified to perform according to published ratings based on official tests. (Air Moving and Conditioning Assn.)

For free copy circle No. 13 on postcard, p. 100

Fasteners

Fasteners, blind rivets and driving tools for the aircraft industry are covered in a 12-page catalog. (Huck Mfg. Co.)

For free copy circle No. 14 on postcard, p. 100

Hot Stamping

Literature details a new hot stamping machine. This machine boasts: (1) a simple, powerful air

FREE LITERATURE

pressure system; (2) new safety features; (3) high heat capacity in the die head; (4) an adjustable and removable slide type die and type holder; (5) 9½-in. die clearance, 8-in. throat and a maximum 6 x 6 die area. (The Acromark Co.)
For free copy circle No. 15 on postcard, p. 100

Materials Handlers

Cushion tired lift trucks are dealt with in a dozen-page brochure. Functionally designed, these trucks come in a 6000 to 8000-lb. capacity range. (Hyster Co.)
For free copy circle No. 16 on postcard, p. 100

Compressed-air Dryers

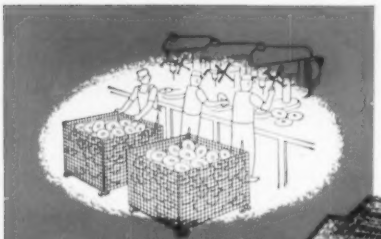
Compressed-air dryers are outlined in a 12-page bulletin. It describes new heatless, self-activating, zero-dewpoint dryers. Units come in 1 to 5400-scfm, 100 to 3000-psi capacities. (Van Products Co.)
For free copy circle No. 17 on postcard, p. 100

Power Transmission

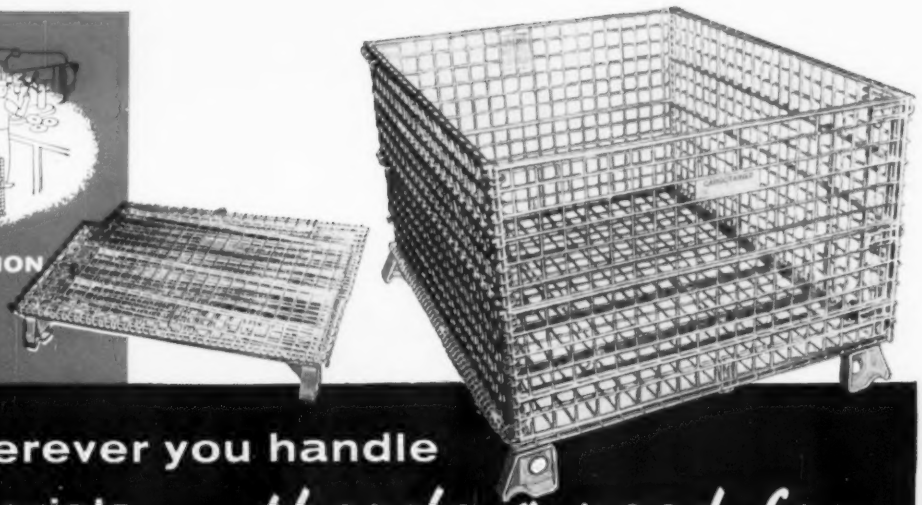
A 4-page bulletin introduces a firm's new line of heavy-duty speed reducers and load supporting type flexible couplings. Designed for driving heavy rotating machinery at low and medium speeds, both parallel shaft and right angle type units are offered for severe service applications in ratings up to 1500 hp. (The H. W. North Co.)
For free copy circle No. 18 on postcard, p. 100

Gas Welding

Oxy-acetylene welding and cutting equipment is featured in a 36-page catalog. It includes recommended applications of a line of oxy-acetylene welding and cutting torches, air-acetylene torches, machine cutting torches, welding regulators, industrial regulators, pressure gages, tank couplings, adapters and hose connections. (Modern Engineering Co.)
For free copy circle No. 19 on postcard, p. 100

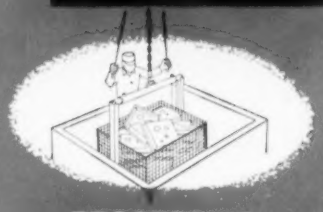


PRODUCTION



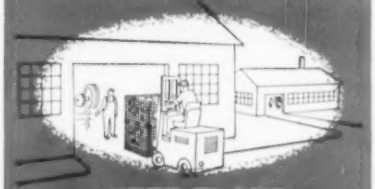
Wherever you handle materials . . . *there's a need for*

CARGOTAINERS®

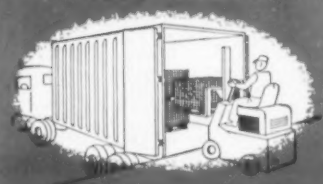


PROCESSING

STORAGE



INTER-PLANT TRANSPORTATION



SHIPPING

On production lines; in processing operations; in storage and warehousing; in shipping or in inter-plant materials moving—CARGOTAINERS answer many of your materials handling problems.

CARGOTAINERS are available in Clearview and Strip Base models, each in several sizes and capacities. Optional features include full or partial drop ends and sides; crane eyes; vertical and horizontal dividers. There is a CARGOTAINER which will exactly meet the requirements of virtually every application.

All models and types fold compactly when not in use, thus saving storage space and also cutting return cost when they are used as shipping containers.

CARGOTAINERS are made of heavy gauge steel wire, and coated with pre-heated, corrosion-resistant vinyl aluminum paint. They are light in weight but strong and rugged for dependable, maintenance-free service year after year, even under exceptionally severe conditions.

Standard capacities are 2,000, 3,000, 4,000 and 6,000 pounds; standard sizes 32″ x 40″ x 24″, 32″ x 40″ x 28″ (3,000 lb. cap.), 36″ x 46″ x 24″, 40″ x 48″ x 24″ and 48″ x 48″ x 24″.

Our new catalog gives full information on CARGOTAINERS, and also on Tri-State Pallets and Tri-State Conveyor Guard. May we send you a copy?

CARGOTAINER DIVISION

TRI-STATE ENGINEERING COMPANY

Washington, Pennsylvania.

MEMBER

FREE LITERATURE

Continued

These publications describe money-saving equipment and services . . . they are free with no obligation . . . just circle the number and mail the postcard.

Aluminum Sheet

Much useful data on aluminum sheet is contained in a 28-page booklet. It's primarily a working reference for persons in fields in which aluminum is already established as a major raw material. (Revere Copper & Brass, Inc.)

For free copy circle No. 21 on postcard

End Face Seals

End face seals in standard sizes are covered in a 6-page folder. Pre-engineered to meet a wide range of sealing requirements, the new seals come in two complete series, long and short. (Chicago Rawhide Mfg. Co.)

For free copy circle No. 22 on postcard

Fork Trucks

Tips on operating fork lift trucks safely are contained in an 8-page brochure (Lewis-Shepard Products, Inc.)

For free copy circle No. 23 on postcard

Hard Anodizing

In its 20-pages a brochure deals with precious finishes on metals. It places particular emphasis on a hard anodizing process. (Anadite Corp.)

For free copy circle No. 24 on postcard

Special Metals

A 5-page bulletin describes melting, fabricating, testing, and quality-control facilities of a company's new nuclear and specialty metals plant. Designed primarily for manufacturing atomic fuel elements and components, the plant also will fabricate and clad rare and refractory metal parts, including zirconium, titanium, hafnium, niobium, tantalum, thorium, uranium, common ferrous and non-ferrous pure metals and alloys. (D. E. Makepeace Co.)

For free copy circle No. 25 on postcard

Machine Spindles

Written for precision grinding, precision milling, or precision boring machine users is a new brochure. This 4-page publication describes standard spindles and special spindles made to specifications for such equipment. And it briefly explains a fast, low-cost spindle repair service. (Pope Machinery Corp.)

For free copy circle No. 26 on postcard

Rheostat Elements

Carbon discs, plates and pile assemblies for all types of carbon pile rheostats and similar control units are discussed in a 5-page bulletin. (Speer Carbon Co.)

For free copy circle No. 27 on postcard

Separators

New 30-in. vibrating screen separators are detailed in a 4-page catalog. These separators screen all types of dry materials and separate solids from liquids. (Southwestern Engineering Co.)

For free copy circle No. 28 on postcard

Control Switches

Construction features of one maker's instrument and control switches and their advantages are discussed in an 8-page bulletin. They are rated for 20 amp continuous capacity with 600 v insulation. (Allis-Chalmers Mfg. Co.)

For free copy circle No. 29 on postcard

Back-geared Press

Technical details and price information on a new 10-ton back geared press are given in a firm's literature. This back-gearing design prolongs inertial force developed by the oversize flywheel over a long ram stroke; it slows the ram speed. This combination adapts this par-

Postcard valid 8 weeks only. After that use own letterhead fully describing items wanted. 1/16/58

Circle numbers for Free Technical Literature or Information on New Equipment:

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70

If you want more details on products advertised in this issue fill in below:

Page .....Product .....

Page .....Product .....

Page .....Product .....

PLEASE TYPE OR PRINT

.....
Your Name

.....
Title

.....
Company

.....
Co. Address

.....
City Zone

.....
State

FIRST CLASS
PERMIT No. 36
(Sec. 34.9 P.L.&R.)
New York, N. Y.

BUSINESS REPLY CARD
No postage necessary if mailed in the United States

POSTAGE WILL BE PAID BY

THE IRON AGE
Post Office Box 77
Village Station
NEW YORK 14, N. Y.

Postcard valid 8 weeks only. After that use own letterhead fully describing items wanted. 1/16/58

Circle numbers for Free Technical Literature or Information on New Equipment:

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70

If you want more details on products advertised in this issue fill in below:

Page .....Product .....
Page .....Product .....
Page .....Product .....

PLEASE TYPE OR PRINT

.....
Your Name

.....
Title

.....
Company

.....
Co. Address

.....
City Zone

.....
State

FREE LITERATURE

ticular press to many operations (i.e., deep drawing, necking, expanding, other jobs where metal flow, rather than shearing, is desirable). (Benchmaster Mfg. Co.)

For free copy circle No. 30 on postcard

Hand Lift Trucks

"Mechanical and Hydraulic Hand Lift Trucks" is the title of a 16-page brochure. It answers four prime questions: What such trucks are, how they operate, how to select, and how to use them. One section relates the basic advantages of hand lift trucks. (Assn. of Lift Truck and Portable Elevator Mfgrs.).

For free copy circle No. 31 on postcard

Drill Table

Aimed at machine builders and those contemplating shop equipment replacement, a bulletin describes a plain radial drill table. This unit is for use on virtually any size radial drills, most particularly from 3 to 7-ft arm machines. They are cast of a high grade close grain cast iron, machined to close tolerances. (Lagoe Oswego Corp.)

For free copy circle No. 32 on postcard

Steel Strapping

Packaged lumber and interlace load securement is discussed in a booklet. It offers a simplified yet damage-proof method of packaging and shipping lumber by freight car. Steel strapping is the key. (Acme Steel Co.)

For free copy circle No. 33 on postcard

Aircraft Fasteners

Aircraft fasteners and bolt stumps are presented in a 16-page catalog. It explains the nature of two fastener types and describes their driving cycles. (Huck Mfg. Co.)

For free copy circle No. 34 on postcard

Limit Switch

A bulletin announces a new plug-in precision limit switch. This switch can be replaced in seconds. Reducing downtime considerably. (Micro Switch Div., Minneapolis-Honeywell Regulator Co.)

For free copy circle No. 35 on postcard

Special Steels

Special process equipment and facilities for producing drawn steel shapes are described in an 8-page brochure. (Reliance Div., Eaton Mfg. Co.)

For free copy circle No. 36 on postcard

Precision Gears

Precision gears, commercial gears, speed reducers and motorized reducers are covered in a 6-page folder. It outlines many ranges, sizes and types available. (Grant Gear Works, Inc.)

For free copy circle No. 37 on postcard

Electronics

New ideas in electronics controls for industry are shown in a 12-page bulletin. Illustrated is electronics equipment for automatic control of resistance welders, automated machine tools, precision test equipment, safety equipment, etc. (Robotron Corp.)

For free copy circle No. 38 on postcard

Sling Chains

Sling chains are described in a bulletin. It describes a manufacturer's localized sling chain service program. This has been instituted to solve sling chain problems of slow delivery. (American Chain & Cable Co., Inc.)

For free copy circle No. 39 on postcard

Press Movies

Four 16mm sound and color movies about press equipment are outlined in a brochure. The films cover: (1) inclinable press maintenance; (2) high production press maintenance; (3) how a 250-ton press produces a finished automobile starter brush and plate automatically by passing a blank through an 11-station series of dies; (4) transfer feed presses. (E. W. Bliss Co.)

For free copy circle No. 40 on postcard

Speaking of Records

. . . *our* records show that when a manufacturer once discovers the exceptional and uniform quality of Roebling flat spring steel, he becomes a permanent Roebling customer.

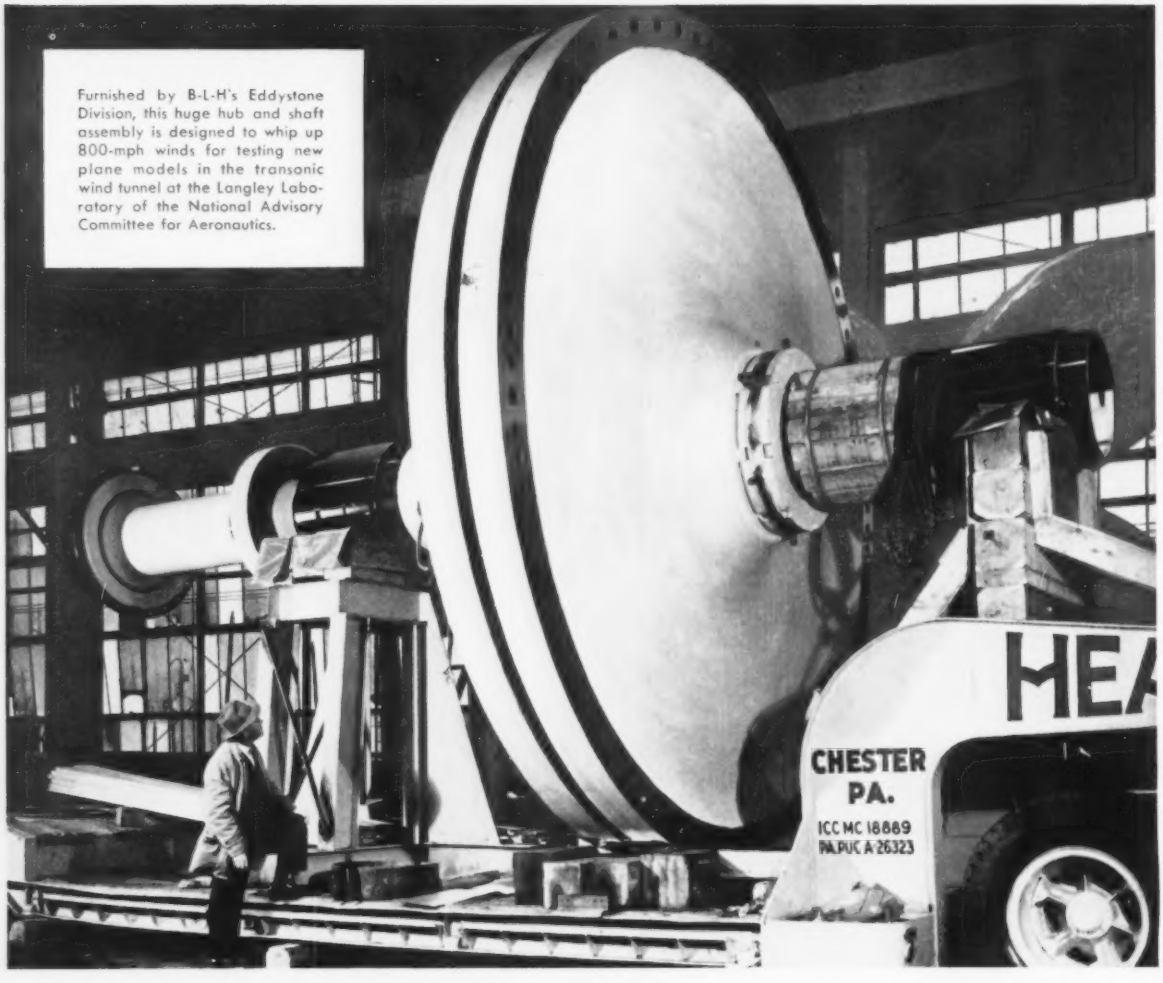
Your records for faster production and lower costs can be improved, in large measure, by Roebling's strict attention to supplying you with the finest flat spring steel available. When you need flat spring steel, specify Roebling. Write Wire and Cold Rolled Steel Products Division, John A. Roebling's Sons Corporation, Trenton 2, New Jersey.

These are typical of the many types of quality parts produced from Roebling flat spring steel.

ROEBLING

Branch Offices in Principal Cities • Subsidiary of The Colorado Fuel and Iron Corporation

Roebling... Your Product is Better for it



Furnished by B-L-H's Eddystone Division, this huge hub and shaft assembly is designed to whip up 800-mph winds for testing new plane models in the transonic wind tunnel at the Langley Laboratory of the National Advisory Committee for Aeronautics.

Baldwin licks another mammoth job . . . 110-ton hub and shaft assembly for transonic wind tunnel

Baldwin-Lima-Hamilton's Eddystone Division was recently faced with another of the enormous assignments that only a shop with its skills and facilities could dare accept . . . providing a gigantic hub and shaft assembly for the fan in the transonic wind tunnel at Langley Air Force Base, Va.

The shaft is 28 ft. long and weighs more than 30 tons. The finished hub weighs over 70 tons, and is 18 ft. in diameter, 44 in. thick at the center and 22 in. at the rim. Contouring, facing and boring were done on a 25-ft. vertical boring mill. Since conventional means were inadequate to slot the keyway in the bore, the bar was run up and down.

In order to attach the 47 fan blade sockets (which were welded by Baldwin and weighed 970 lb. each), 94 holes were drilled around the rim. The tolerance on the hole diameters was +.001 in., −0.0. *Furthermore, each blade socket had to fit any of the 47 positions.*

To shrink-fit the hub to the shaft, a temporary gas-fired furnace had to be built around the hub. After the hub was heated, the furnace was opened, the shaft was picked up by an overhead crane with a special lifting rig and lowered endwise into the shaft bore. It slipped in perfectly, and the retaining nut, weighing 1200 lb., was jacked up from below and screwed on by means of long-handled wrenches specially designed for this purpose.

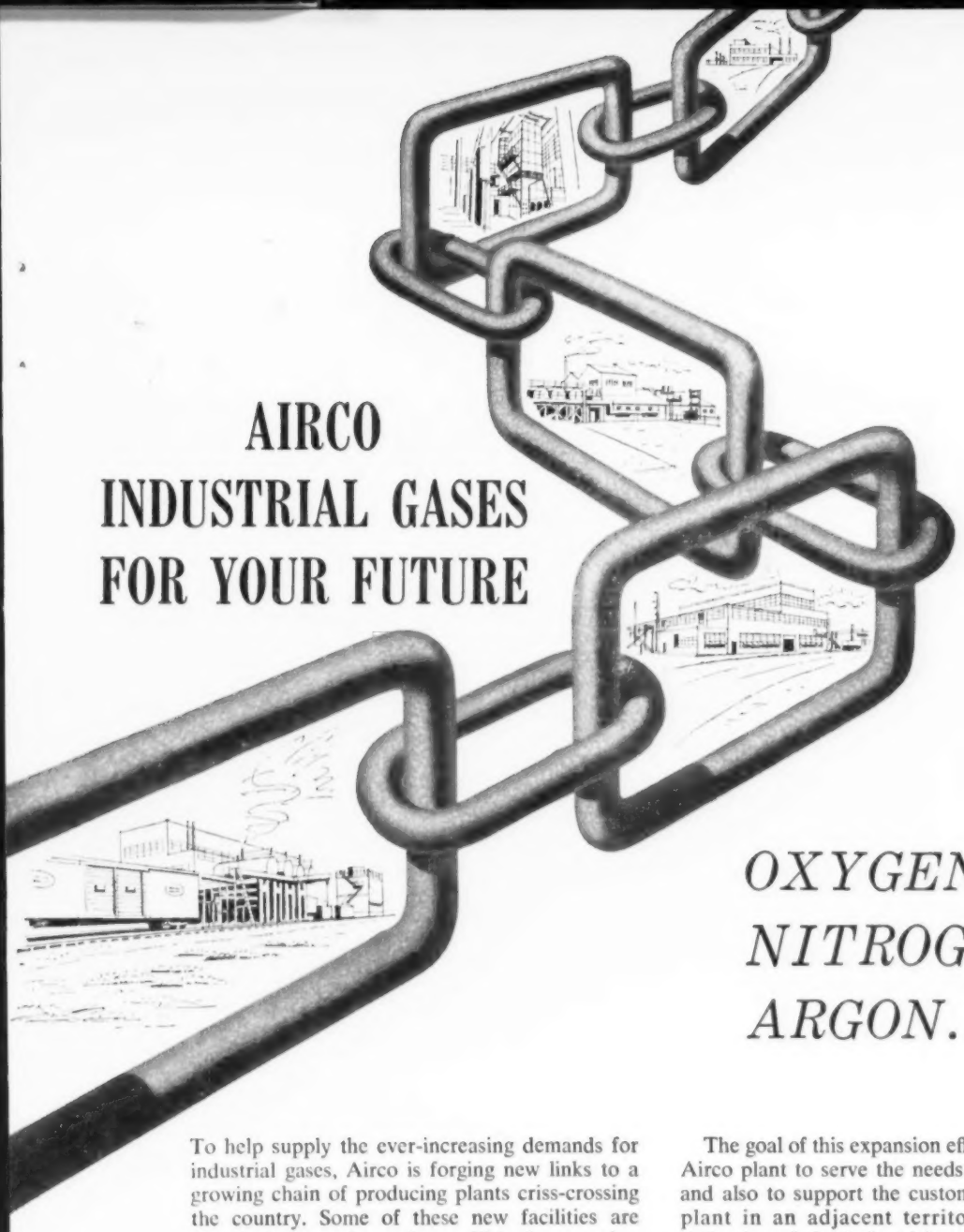
The next time you need fabricating or machining work done, why not call on the company that has proved it can handle the very toughest jobs. For detailed information on any specific project or for a copy of our illustrated Bulletin 7001, write to B-L-H Corporation, Philadelphia 42, Pa.

BALDWIN · LIMA · HAMILTON

Eddystone Division

Philadelphia 42, Pa.

Hydraulic turbines • Weldments • Dump cars • Nonferrous castings • Special machinery • Bending rolls • Machine tools



AIRCO INDUSTRIAL GASES FOR YOUR FUTURE

OXYGEN...
NITROGEN...
ARGON...

To help supply the ever-increasing demands for industrial gases, Airco is forging new links to a growing chain of producing plants criss-crossing the country. Some of these new facilities are already in operation, others will be in operation by the latter part of this year. This multimillion dollar construction program will greatly increase our capacity to supply your present and future requirements for oxygen, nitrogen, argon and other gases.

The goal of this expansion effort is to gear each Airco plant to serve the needs of its own area—and also to support the customers of any Airco plant in an adjacent territory by providing deliveries of the industrial gases needed in the quantities required.

The services Airco offers its customers are well worth your consideration. Let your nearest Airco office help plan the most economical gas supply for your needs and the most efficient way to use it.

AT THE FRONTIERS OF PROGRESS YOU'LL FIND...

AIRCO®

Offices and dealers in most principal cities

AIR REDUCTION SALES COMPANY

A division of Air Reduction Company, Incorporated
150 East 42nd Street, New York 17, N. Y.

On the west coast—
Air Reduction Pacific Company

Internationally—
Airco Company International

In Cuba—
Cuban Air Products Corporation

In Canada—
Air Reduction Canada Limited

Products of the divisions of Air Reduction Company, Incorporated, include: **AIRCO** — industrial gases, welding and cutting equipment, and acetylenic chemicals • **PURECO** — carbon dioxide — gaseous, liquid, solid ("DRY-ICE") • **OHIO** — medical gases and hospital equipment • **NATIONAL CARBIDE** — pipeline acetylene and calcium carbide • **COLTON** — polyvinyl acetate, alcohols, and other synthetic resins.

Sheet and strip—more than 20 kinds—and Ryerson delivers fast!

You name it—Ryerson has it.

Hot and cold rolled sheets. Pickled and oiled sheets. Tight-coated galvanized and galvannealed sheets that won't flake or peel when you form them. Stainless sheets. Ryex expanded metal. Perforated sheets. And many others, all in a wide range of gauges and pattern sizes.

Need special sizes? Modern equipment cuts them to your specifications quickly and economically, in blanks, straight lengths or coils.

Ryerson also offers a complete line of metalworking machinery and tools to meet virtually every requirement.

When you want sheet and strip, give Ryerson a call—it pays!

RYERSON CERTIFIED QUALITY

RYERSON STEEL

Member of the INLAND Steel Family

Principal Products: Carbon, alloy and stainless steel—bars, structurals, plates, tubing, industrial plastics, etc.

JOSEPH T. RYERSON & SON, INC. PLANTS AT: NEW YORK • BOSTON • WALLINGFORD, CONN. • PHILADELPHIA • CHARLOTTE • CINCINNATI • CLEVELAND DETROIT • PITTSBURGH • BUFFALO • INDIANAPOLIS • CHICAGO • MILWAUKEE • ST. LOUIS • LOS ANGELES • SAN FRANCISCO • SPOKANE • SEATTLE

The Iron Age Summary

Steel Inventory Picture Brightens

Inventory cuts by steel users are slowing down, say market analysts.

Shipments pick up in second quarter and steady improvement in second half forecast.

• The nation's steel mills may have seen the worst of the steel inventory cutbacks by their customers. This ray of hope in an otherwise dark picture came to light this week.

Steel analysts figure that inventory cutting hit its peak in the fourth quarter of 1957; that from now on less of the steel chewed up by metalworking plants will be taken from inventory.

Inventory Cuts Easing—It's estimated that finished steel stocks held by industry dropped from a high of 22.5 million tons in first quarter 1957 to about 16.5 million tons at the end of last year. Heaviest cuts—3.2 million tons—came in fourth quarter.

Steel sources figure that industry will drop another three million tons from inventory during the next three months. But only about one million tons will be taken from users' stocks in the second quarter.

Mid-Year Low Point — This means that user inventories of steel will be down to 12.5 million tons by mid-year—equal to the low point reached in the recession year of 1954. This is considered rock bottom for the current level of economic activity.

All this points to a pickup in steel shipments in the second quarter and a steady improvement in the second half. If steel use holds up this will almost certainly be the pattern. Steel men are hopeful that industrial activity will not sag seriously enough to upset this analysis.

Automotive Lags—Steel inventories in the hands of some companies have just about touched bottom. Here's the lament of an executive in the planning department of an auto parts supplier: "They've just cut my steel inventory from seven days to six. All of my inventory is on the highway in trucks."

Biggest drag on the steel market continues to be automotive. The automakers are economy-minded. And this mood, in turn, has affected the production and outlook of auto parts makers. The auto companies are still cutting back on production and laying off workers. It's estimated that by the end of January automotive employment will be off 35,000 from what it was at the beginning of the month.

Housing Outlook Cheers—The auto companies aren't ordering steel, and it doesn't look like they are going to—at least not in any quantity. Steel salesmen say the auto industry isn't giving any indication of what it expects to order in March; and February orders are made up mostly of tonnages shoved back from January.

Steel men are encouraged by the slow but steady improvement in housing starts.

Steel Output, Operating Rates

Production (Net tons, 000 omitted)	This Week 1,538	Last Week 1,515	Month Ago 1,741	Year Ago 2,484
Ingot Index (1947-1949=100)	95.7	94.3	108.3	154.6
Operating Rates				
Chicago	69.0	60.0	71.0	98.0
Pittsburgh	54.5	52.5*	63.0	99.0
Philadelphia	62.0	71.0	74.0	104.0
Valley	49.5	48.0*	56.0	98.0
West	74.0	71.0*	80.0	100.0
Buffalo	54.0	51.0	63.5	105.0
Cleveland	50.0	52.0*	68.0	98.0
Detroit	53.0	63.0*	81.0	105.0
S. Ohio River	66.0	61.0*	70.0	88.5
South	58.0	62.5	71.0	100.0
Upper Ohio R.	57.5	58.0*	63.0	103.0
St. Louis	62.0	79.0*	76.0	100.5
Northeast	31.0	31.0	31.0	31.0
Aggregate		56.1*	68.0	97.0

*Revised, based on new capacity of 140,742,570 tons.

Prices At a Glance

(cents per lb unless otherwise noted)	This Week	Week Ago	Month Ago	Year Ago
Composite price				
Finished Steel, base	5.967	5.967	5.967	5.622
Pig Iron (Gross ton)	$66.42	$66.42	$66.42	$62.90
Scrap, No. 1 hvy (Gross ton)	$33.17	$33.00	$32.00	$59.17
No. 2 bundles	$25.17	$24.67	$24.00	$47.50
Nonferrous				
Aluminum ingot	28.10	28.10	28.10	27.10
Copper, electrolytic	27.00	27.00	27.00	36.00
Lead, St. Louis	12.80	12.80	12.80	15.80
Magnesium ingot	36.00	36.00	36.00	36.00
Nickel, electrolytic	74.00	74.00	74.00	74.00
Tin Straits, N. Y.	93.50	93.00	92.50	101.00
Zinc, E. St. Louis	10.00	10.00	10.00	13.50

Forgers Make Rush Deliveries

Buyers of forgings are shopping around these days to get fast shipment.

Their pressure for lower prices on light forgings isn't succeeding.

■ Forgers, at least a sprinkling of them, report that while business currently on the books looks as if it will continue at December levels through January, inquiries are registering a slight gain. Customers are shopping for quick delivery, indicating there are extremely low consumer inventories in virtually all categories of forgings. Requests are coming in for material that customers want on almost warehouse delivery terms.

The effect, in many forge shops, has been to boost operating costs. Rush-rush orders always have that result, particularly in periods when many forge shops are working with a reduced work force and must reactivate idle equipment for short production runs.

Prices Under Fire—Coupled with this has been some increase in pressure for price reductions. It's worth noting that forging prices have held firmly. There's been scattered evidence of price shaving on light, low tolerance requirement forgings, but it's indicative of the tight cost squeeze that few forge shops have been able to make general price reductions.

There's opinion that where price-cutting has occasionally occurred, the seller was not able to meet his own costs. With operating costs continuing to rise it appears doubtful that the small number of price cuts reported thus far will increase, or even continue.

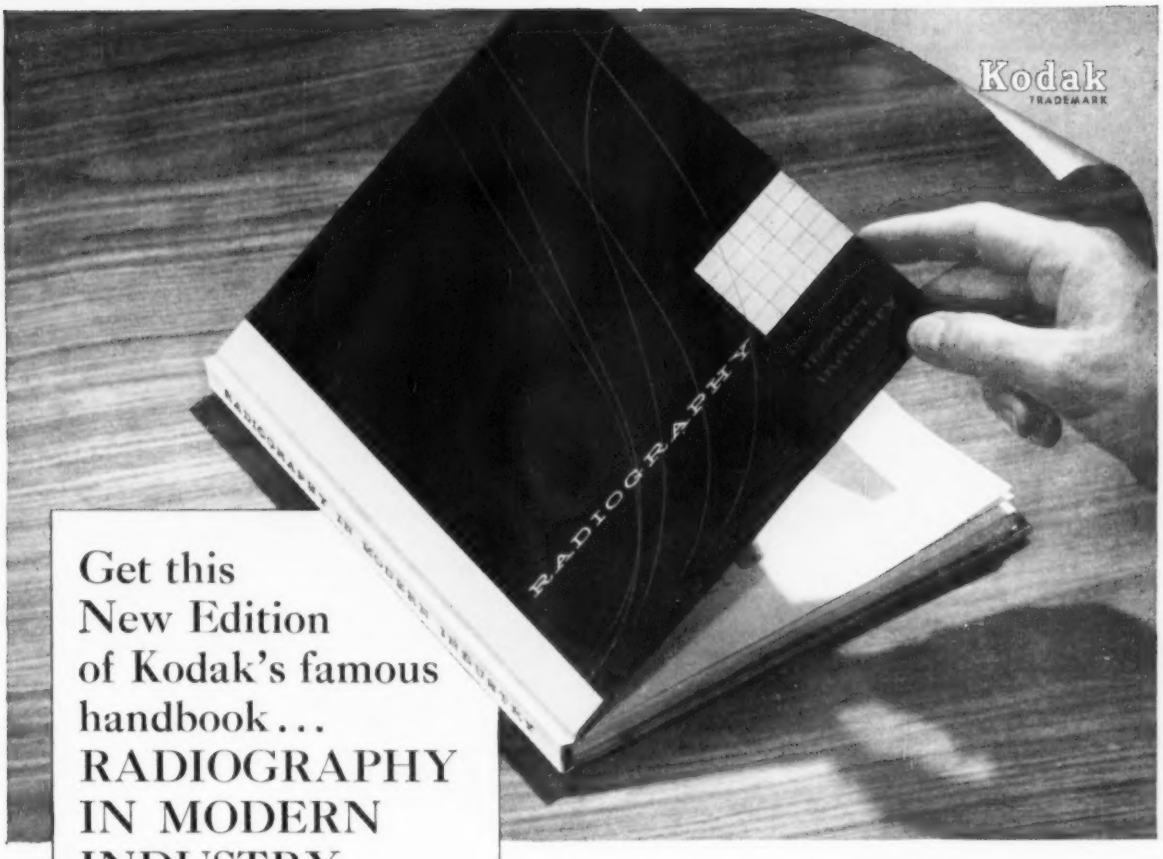
Backlogs Dropping—Government figures placed the decline in forgings tonnages at about 15 pct below last year's figure in the opening weeks of fourth quarter 1957. At the same time, the backlog of unfilled orders continued to decline at a somewhat faster rate, with the backlog tonnage figure off 25 pct as opposed to the 15 pct decline in actual shipments.

A major problem for many forgers has been the continuing holdup of any important auto industry purchases. While the rest of the customer list has held fairly firm, automotive has failed to show any of its usual spring zip.

Defense Work Rebounds—Meanwhile the 1957 slowdown in high-tolerance forgings for defense work, notably aircraft, has already begun to give indications of an early rebound. While defense contract work doesn't figure heavily in total forgings tonnages produced, the higher dollar value of the individual workpieces boosts defense dollar figures significantly. While no one is pounding the drum, there's a growing spirit of optimism in this quarter which is now being confirmed by new defense contract lettings.

Some Price Hikes Possible—Will prices go up? They may but at the moment it appears there will be virtually no increases through at least March, when the cost picture, particularly on the labor front, will be clearer. Certainly, the heavy consumer price pressure in on lighter forgings. Many forgers see this category holding at present levels, but with increases in higher tolerance, heavier forgings. All agree, however, that any increases will be moderate.

COMPETITION STIFFENS: Manufacturers of forgings are in stiff battle for business these days. Backlogs are declining and they're making fast deliveries while trying to hold costs down. (Kropp Forge Co. photo.)



Get this New Edition of Kodak's famous handbook... RADIOGRAPHY IN MODERN INDUSTRY

An authoritative, up-to-the-minute text which explains the fundamentals of x-rays and gamma rays, and their use in radiography for industry.

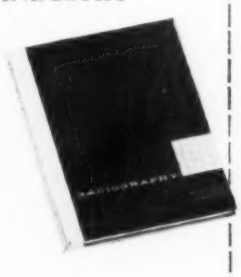
Everyone interested in industrial radiography should have the latest edition of this famous handbook. It contains all the information found in the previous text, plus up-to-the-minute additions. It tells about new technics, new sources of radiation, and new fast films; explains proper methods of using them.

No one engaged in radiography should be without this latest edition of *Radiography in Modern Industry*. Get it from your Kodak x-ray dealer, or send coupon below.

EASTMAN KODAK COMPANY · *X-ray Division* · Rochester 4, N. Y.

RADIOGRAPHY IN MODERN INDUSTRY

- size 8½ x 11 inches
- hard cover, case-bound
- 140 pages of information
- 15 chapters
- 101 text illustrations
- 19 tables
- appendix
- bibliography
- cross index
- Price, $5.00



EASTMAN KODAK COMPANY
X-ray Division, Rochester 4, N. Y.

Gentlemen: Enclosed is $5.00. Please send me "Radiography in Modern Industry."

22-1

Name _____

Address _____

City _____

State _____

STEEL PRODUCT MARKETS

Mills Looking Ahead To Spring Upturn

With users waiting until the last minute to order, mills are having trouble estimating business far in advance.

But they are counting on some improvement when the second quarter gets underway.

▪ User buying habits are hampering the efforts of steel salesmen to get a clear view of the market.

With customers asking for rapid delivery on many products and waiting until the last minute to order, an accurate appraisal of any one month's business isn't easy.

Orders for hot-rolled sheet, for example, are coming in with a 10-day delivery request and buyers want cold-rolled in 2 to 3 weeks. Some producers of cold finished bar report they usually start the month with nothing on the books but wind up placing 50 pct of available tonnage.

Beware the Ides—What buyers do about March-April orders could be important. Some pickup in automotive steel buying is expected then by the mills. However, currently the Detroit steel users aren't committing themselves on that month. And their February tonnage is mostly material shoved back from January.

Plate producers, whose books are in much better shape, are nevertheless counting on second quarter orders to restore some missing tone to the market. January and February buying has left something to be desired.

Pipe Better—Only in the pipe and tube market is there any real indication of current improvement. An Eastern mill reports that, except for oil-country products, January business at midway in the month had already topped all of December. Sharing in the pickup were seamless and buttweld pipe.

It's the perennially strong linepipe market that is causing current headaches. Mills are scurrying around reselling first quarter tonnages which were cancelled.

Sheet and Strip—Hand-to-mouth buying, auto tonnage deferments, and rapid deliveries continue dominating the flat-rolled market. Some pickup in automotive steel buying is expected in March or April. Meanwhile, auto firms are reducing orders or setting them back. Some millmen believe the auto buyers are trying to hold their inventories to a 15-day level. Appliance customers are a little more encouraging. Their inventories seem to be in line, and their order pattern has stabilized. Sheet consumption in the Ohio district appears to be up 15 pct in the first quarter over the final quarter of '57. **Eastern** mills are still looking for hot-rolled tonnage for the end of this month. February bookings are slow coming in, and don't show any improvement over January. There has been some scattered activity in enameling iron sheet in the **Midwest** but it hasn't been general.

Plate — February bookings at **Eastern** mills are good, but they report they could use more. Some plate fabricators in the area say business is good, others are less optimistic. Bridge construction and chemical expansion are still good markets for plate. Oil industry construction is slow. **West Coast** mills report heavy plate orders are weak. A good selection of product continues to arrive from **Eastern** mills.

Structurals — Jones & Laughlin Steel Corp. has added to its line of lightweight structurals with production of two joist sections at its Aliquippa, Pa., mill. The joist sections are a 10-in., weighing 11.5 lb per ft, and a 12-in., weighing 14 lb per ft. Both have 4-in. flanges.

Bars—February activity is still a question mark because buyers are slow in putting in orders. **Pittsburgh** mills report January shipments will exceed December's. A producer of cold finished bars in the **Detroit** area reports January releases are running at about the same rate as the initial half of 1954—an extremely bad period. **Chicago** cold finishers are operating at about 50 pct of capacity, glad that business hasn't fallen off any more. There's been a recent mild pickup in cold finished there. **West Coast** mill salesmen are having a tough time keeping backlogs up. Hot-rolled and cold finished bars are available in the **Farwest** on very short delivery.

Wire Products—American Steel & Wire Div. of U. S. Steel at Cleveland is producing a new aluminum coated barbed wire and farm fence claimed to outlast conventional zinc-coated types by a wide margin. The new wire, described as virtually free of progressive corrosion, turns golden bronze in color after short exposure time. It is being made in 9 to 14 gage.

PURCHASING AGENT'S CHECKLIST

Beryllium sheets bought by Air Force for study in aircraft and missile applications. **P. 44**

Is there a point beyond which speed will prolong, not shorten, tool life? **P. 63**

Power brushes take on maintenance job. P. 80

COMPARISON OF PRICES

(Effective Jan. 14, 1958)

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Price advances over previous week are printed in **Heavy Type**; declines appear in *Italics*.

	Jan. 14 1958	Jan. 7 1958	Dec. 10 1957	Jan. 15 1957
Flat-Rolled Steel: (per pound)				
Hot-rolled sheets	4.925¢	4.925¢	4.925¢	4.675¢
Cold-rolled sheets	6.05	6.05	6.05	5.75
Galvanized sheets (10 ga.)	6.60	6.60	6.60	6.30
Hot-rolled strip	4.925	4.925	4.925	4.675
Cold-rolled strip	7.17	7.17	7.17	6.870
Plate	5.12	5.12	5.12	4.87
Plates, wrought iron	13.15	13.15	13.15	10.40
Stainl's C-R strip (No. 302)	52.00	52.00	52.00	47.50
Tin and Terneplate: (per base box)				
Tinplate (1.50 lb.) cokes	$10.30	$10.30	$10.30	$9.95
Tin plates, electro (0.50 lb.)	9.00	9.00	9.00	8.65
Special coated mfg. ternes	9.55	9.55	9.55	9.20
Bars and Shapes: (per pound)				
Merchant bar	5.425¢	5.425¢	5.425¢	5.075¢
Cold finished bars	7.30	7.30	7.30	6.85
Alloy bars	6.475	6.475	6.475	6.125
Structural shapes	5.275	5.275	5.275	5.00
Stainless bars (No. 302)	45.00	45.00	45.00	40¾-43¼
Wrought iron bars	14.45	14.45	14.45	11.50
Wire: (per pound)				
Bright wire	7.65¢	7.65¢	7.65¢	7.20¢
Rails: (per 100 lb.)				
Heavy rails	$5.525	$5.525	$5.525	$5.075
Light rails	6.50	6.50	6.50	6.00
Semifinished Steel: (per net ton)				
Rerolling billets	$77.50	$77.50	$77.50	$74.00
Slabs, rerolling	77.50	77.50	77.50	74.00
Forging billets	96.00	96.00	96.00	91.50
Alloy blooms, billets, slabs	114.00	114.00	114.00	107.00
Wire Rods and Skelp: (per pound)				
Wire rods	6.15¢	6.15¢	6.15¢	5.80¢
Skelp	4.875	4.875	4.875	4.225
Finished Steel Composite: (per pound)				
Base price	5.967¢	5.967¢	5.967¢	5.622¢

	Jan. 14 1958	Jan. 7 1958	Dec. 10 1957	Jan. 15 1957
Pig Iron: (per gross ton)				
Foundry, del'd Phila.	$70.51	$70.51	$70.51	$66.88
Foundry, Valley	66.50	66.50	66.50	63.00
Foundry, Southern Cin'ti	71.65	71.65	71.65	67.17
Foundry, Birmingham	62.50	62.50	62.50	59.00
Foundry, Chicago	66.50	66.50	66.50	63.00
Basic, del'd Philadelphia	70.01	70.01	70.01	66.38
Basic, Valley furnace	66.00	66.00	66.00	62.50
Malleable, Chicago	66.50	66.50	66.50	63.00
Malleable, Valley	66.50	66.50	66.50	63.00
Ferromanganese, 74-76 pct Mn, cents per lb‡	12.25	12.25	12.25	12.75
Pig Iron Composite: (per gross ton)				
Pig iron	$66.42	$66.42	$66.42	$62.90
Scrap: (per gross ton)				
No. 1 steel, Pittsburgh	$32.50	$32.50	$32.50	$61.50
No. 1 steel, Phila. area	36.50	36.00•	33.00	58.50
No. 1 steel, Chicago	30.50	30.50	30.50	57.50
No. 1 bundles, Detroit	21.50	21.50	21.50	51.50
Low phos., Youngstown	35.50	34.50	33.50	66.50
No. 1 mach'y cast, Pittsburgh	49.50	49.50	50.50	60.50
No. 1 mach'y cast, Philadel'a	*47.50*	48.50•	50.50	60.50
No. 1 mach'y cast, Chicago	45.50	44.50	40.50	55.50
Steel Scrap Composite: (per gross ton)				
No. 1 hvy. melting scrap	$33.17	$33.00	$32.00	$59.17
No. 2 bundles	25.17	24.67	24.00	47.50
Coke, Connellsville: (per net ton at oven)				
Furnace coke, prompt	$15.38	$15.38	$15.38	$15.50
Foundry coke, prompt	$17.50-$19	$17.50-$19	$17.50-$19	$18-19
Nonferrous Metals: (cents per pound to large buyers)				
Copper, electrolytic, Conn.	25.00	27.00	27.00	36.00
Copper, Lake, Conn.	25.00	27.00	27.00	36.00
Tin, Straits, N. Y.	93.50†	93.00	92.50	101.00
Zinc, East St. Louis	10.00	10.00	10.00	13.50
Lead, St. Louis	12.80	12.80	12.80	15.80
Aluminum, virgin ingot	28.10	28.10	28.10	27.10
Nickel, electrolytic	74.00	74.00	74.00	74.00
Magnesium, ingot	36.00	36.00	36.00	36.00
Antimony, Laredo, Tex.	33.00	33.00	33.00	33.00

† Tentative. ‡ Average. • Revised.

Finished Steel Composite

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold rolled sheets and strips.

Pig Iron Composite

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

Steel Scrap Composite

Averages of No. 1 heavy melting steel scrap delivered to consumers at Pittsburgh, Philadelphia and Chicago.

INDEX TO PRICE PAGES

IRON AND STEEL SCRAP MARKETS

Market Shows Some Slight Gains

It's not an uptrend yet, but the market is trying to get off the bottom.

Drop and continued weakness on West Coast offset gains in other areas.

▪ The market began a sideways movement with some increases here and there.

In Chicago an upturn in premium grades and some advances in broker buying gave a firmer tone to the market. In Philadelphia, a mill purchase served to narrow the spread. And in Cleveland and the Valley, activity in electric furnaces brought most openhearth grades up $1.

On the other hand, West Coast markets dropped roughly $2 for openhearth grades, with the new, low level none too strong. Domestic market is very weak there, with little export to peg the market.

By and large, the upward fluctuations are of little significance in establishing a trend. Feeling is that any major buy would have to raise prices, but mills are not in a hurry.

Pittsburgh — Prices of most grades are unchanged. Railroad lists and scattered mill purchases show the market moving sideways at what seems to be the bottom. One consumer is paying $32 for No. 2 steel and $29 for No. 2 bundles. Another is also paying $29 for No. 2 bundles. The $32 price for No. 2 steel brought a brief flurry of broker interest, but there is no sustained strength in the market. Machine shop turnings are moving freely at $17.

Chicago — Steelmaking grades continued to level. Differentials between No. 1 and No. 2 grades are shrinking. Heavy shipment of scrap on older, higher-priced orders continues to take up scrap available in the district, with the result that broker buying has been forced $1 to $2 higher. Mill purchasing outlook is not strong, but shrinking supplies and an increase in the rate of shipment on old orders are putting a strong upward pressure on the market. A few grades slipped, but this is offset by advances in other grades.

Philadelphia—A mill purchase of No. 1 heavy melting at quoted prices gave strength to this market. The broker buying price for this grade is reported at $36, closing the spread that existed during the past month. A sale of No. 2 heavy melting was made at $34, an increase of $1. Rail crops dropped $4.

New York—There are no price changes in this market. A report that selected dealers may get a premium for high grade openhearth scrap injected a note of optimism into the market.

Detroit—Cutbacks in automobile production are taking a double swipe at dealers here. Mill operations are off, further reducing what remains of mill demand. However, scrap generation is down, reducing material available for dealers.

Cleveland—The Valley showed some strength at about $1 higher as electric furnace mills bought for inventory because of the attractive price. An additional small purchase of dealer scrap also bolstered the market. In Cleveland, cut structural jumped $2 as foundries had to increase earlier price to pry scrap loose from dealers. Railroad lists are showing strength in the Valley because of low tonnage offered.

St. Louis—Demand for scrap has slackened. Leading consumers are buying only small quantities, as the operating rate has dropped significantly. Movement to yards is slow, with little coming from either the country or industry. Because of scarcity, prices are holding to their levels.

Birmingham—There was a little activity in electric furnace, turnings, and cast scrap, with some items advancing $1. Some brokers report scrap moving a little better, but sellers are those hard-pressed financially. Large dealers who can afford to do so are holding on to inventories. An Atlanta mill purchased No. 2 heavy melting at $28 per ton and No. 2 bundles at $18 a ton delivered. The export market is dull.

Cincinnati—Start-up of another openhearth in this area is the only encouraging note. Dealers continue to spurn orders at offered price and upriver markets continue lethargic.

Buffalo—Small sales of No. 1 heavy melting and No. 2 heavy melting were made at quoted prices. No. 1 cupola cast fell off $1 on a sale. Other grades are dormant in a quite market.

Boston—No. 1 busheling is down $1, with an apparent differential now being established between that grade and the level of No. 1 heavy melting and No. 1 bundles. Previously, the three grades brought the same price.

West Coast—Prices dropped another $2 per ton in major markets. They are weak at the new, lower levels. Two important mills are only buying on a hand-to-mouth basis. Exporting remains at a standstill. There are no signs of a revival until the second quarter.

NEW WELDCO Pipe Testing Machine

WELDCO Installation in the St. Henry Works of The Steel Co. of Canada, Ltd.

WELDCO Automatic Pipe Testing Machines test up to 1,000 pieces of pipe per hour . . . 1/2" through 4" in single, random lengths.

- Fully automatic on uniform lengths, and require only one man to operate.
- Maximum test pressure up to 5,000 psi.
- Low initial cost.
- Controls are all on one panel—for convenient, fast operation.
- Easy manual adjustment for random lengths—in a matter of seconds!
- Advanced design . . . for low-cost maintenance and trouble-free operation.

It will pay you to get the rest of the story. Just phone or write us today.

WELDCO

THE YOUNGSTOWN WELDING & ENGINEERING CO.
3724 OAKWOOD AVE. • YOUNGSTOWN 9, OHIO

SCRAP PRICES *(Effective Jan. 14, 1958)*

Iron and Steel Scrap

Going prices of iron and steel scrap as obtained in the trade by THE IRON AGE based on representative tonnages. All prices are per gross ton delivered to consumer unless otherwise noted.

Pittsburgh

No. 1 hvy. melting	$32.00 to $33.00
No. 2 hvy. melting	30.00 to 31.00
No. 1 dealer bundles	32.00 to 33.00
No. 1 factory bundles	35.00 to 36.00
No. 2 bundles	28.00 to 29.00
No. 1 busheling	32.00 to 33.00
Machine shop turn.	16.00 to 17.00
Mixed bor. and ms. turn.	16.00 to 17.00
Shoveling turnings	20.00 to 21.00
Cast iron borings	20.00 to 21.00
Low phos. punch'gs plate	36.00 to 37.00
Heavy turnings	31.00 to 32.00
No. 1 RR hvy. melting	36.00 to 37.00
Scrap rails, random lgth.	47.00 to 48.00
Rails 2 ft and under	54.00 to 55.00
RR steel wheels	45.00 to 46.00
RR spring steel	45.00 to 46.00
RR couplers and knuckles	45.00 to 46.00
No. 1 machinery cast.	49.00 to 50.00
Cupola cast.	39.00 to 40.00
Heavy breakable cast.	37.00 to 38.00

Chicago

No. 1 hvy. melting	$30.00 to $31.00
No. 2 hvy. melting	29.00 to 30.00
No. 1 dealer bundles	30.00 to 31.00
No. 1 factory bundles	34.00 to 35.00
No. 2 bundles	21.00 to 22.00
No. 1 busheling	29.00 to 30.00
Machine shop turn.	15.00 to 16.00
Mixed bor. and turn.	17.00 to 18.00
Shoveling turnings	17.00 to 18.00
Cast iron borings	17.00 to 18.00
Low phos. forge crops	47.00 to 48.00
Low phos. punch'gs plate	43.00 to 44.00
Low phos. 3 ft and under	42.00 to 43.00
No. 1 RR hvy. melting	35.00 to 36.00
Scrap rails, random lgth.	44.00 to 45.00
Rerolling rails	50.00 to 51.00
Rails 2 ft and under	53.00 to 54.00
Locomotive tires cut	45.00 to 46.00
Cut bolsters & side frames	42.00 to 43.00
Angles and splice bars	47.00 to 48.00
RR steel car axles	50.00 to 51.00
RR couplers and knuckles	44.00 to 45.00
No. 1 machinery cast	45.00 to 46.00
Cupola cast.	39.00 to 40.00
Heavy breakable cast.	37.00 to 38.00
Cast iron brake shoe	37.00 to 38.00
Cast iron wheels	36.00 to 37.00
Malleable	50.00 to 51.00
Stove plate	37.00 to 38.00
Steel car wheels	45.00 to 46.00

Philadelphia Area

No. 1 hvy. melting	$36.00 to $37.00
No. 2 hvy. melting	33.00 to 34.00
No. 1 dealer bundles	36.00 to 37.00
No. 2 bundles	25.00 to 27.00
No. 1 busheling	36.00 to 37.00
Machine shop turn.	20.00 to 21.00
Mixed bor. short turn.	21.00 to 22.00
Cast iron borings	22.00 to 23.00
Shoveling turnings	22.00 to 23.00
Clean cast. chem. borings	30.00 to 31.00
Low phos. 5 ft and under	39.00 to 40.00
Low phos. 2 ft and under	40.00 to 41.00
Low phos. punch'gs	40.00 to 41.00
Elec. furnace bundles	36.00 to 37.00
Heavy turnings	30.00 to 31.00
RR steel wheels	45.00 to 46.00
RR spring steel	45.00 to 46.00
Rails 18 in. and under	58.00 to 60.00
Cupola cast.	36.00 to 38.00
Heavy breakable cast.	38.00 to 39.00
Cast iron car wheels	40.00 to 41.00
Malleable	55.00 to 56.00
Unstripped motor blocks	32.00 to 33.00
No. 1 machinery cast.	47.00 to 48.00

Cleveland

No. 1 hvy. melting	$28.00 to $29.00
No. 2 hvy. melting	22.00 to 23.00
No. 1 dealer bundles	28.00 to 29.00
No. 1 factory bundles	31.00 to 32.00
No. 2 bundles	22.00 to 23.00
No. 1 busheling	28.00 to 29.00
Machine shop turn.	10.00 to 11.00
Mixed bor. and turn.	14.00 to 15.00
Shoveling turnings	14.00 to 15.00
Cast iron borings	14.00 to 15.00
Cut struct'r'l & plates, 2 ft & under	36.00 to 37.00
Drop forge flashings	28.00 to 29.00
Low phos. punch'gs, plate	29.00 to 30.00
Foundry steel, 2 ft & under	33.00 to 34.00
No. 1 RR heavy melting	34.00 to 35.00
Rails 2 ft and under	54.00 to 55.00
Rails 18 in. and under	55.00 to 56.00
Railroad grate bars	15.00 to 16.00
Steel axle turnings	16.00 to 17.00
Railroad cast.	46.00 to 47.00
No. 1 machinery cast.	45.00 to 46.00
Stove plate	42.00 to 43.00
Malleable	57.00 to 58.00

Youngstown

No. 1 hvy. melting	$32.00 to $33.00
No. 2 hvy. melting	25.00 to 26.00
No. 1 dealer bundles	32.00 to 33.00
No. 2 bundles	25.00 to 26.00
Machine shop turn.	13.00 to 14.00
Shoveling turnings	17.00 to 18.00
Cast iron borings	17.00 to 18.00
Low phos. plate	35.00 to 36.00

Buffalo

No. 1 hvy. melting	$28.00 to $29.00
No. 2 hvy. melting	25.50 to 26.50
No. 1 busheling	28.00 to 29.00
No. 1 dealer bundles	28.00 to 29.00
No. 2 bundles	22.50 to 23.50
Machine shop turn.	12.00 to 13.00
Mixed bor. and turn.	13.00 to 14.00
Shoveling turnings	15.00 to 16.00
Cast iron borings	14.00 to 15.00
Low phos. plate	34.00 to 35.00
Scrap rails, random lgth.	40.00 to 41.00
Rails 2 ft and under	50.00 to 51.00
RR steel wheels	37.00 to 38.00
RR spring steel	33.00 to 34.00
RR couplers and knucklers	33.00 to 34.00
No. 1 machinery cast.	40.00 to 41.00
No. 1 cupola cast.	34.00 to 35.00

Detroit

Brokers buying prices per gross ton, on cars:

No. 1 hvy. melting	$21.00 to $22.00
No. 2 hvy. melting	16.00 to 17.00
No. 1 dealer bundles	21.00 to 22.00
No. 2 bundles	14.00 to 15.00
No. 1 busheling	20.00 to 21.00
Drop forge flashings	18.00 to 19.00
Machine shop turn.	7.00 to 8.00
Mixed bor. and turn.	9.00 to 10.00
Shoveling turnings	9.00 to 10.00
Cast iron borings	9.00 to 10.00
Low phos. punch'gs plate	19.00 to 20.00
No. 1 cupola cast.	27.00 to 28.00
Heavy breakable cast.	22.00 to 23.00
Stove plate	22.00 to 23.00
Automotive cast.	30.00 to 31.00

St. Louis

No. 1 hvy. melting	$32.00 to $33.00
No. 2 hvy. melting	29.00 to 30.00
No. 1 dealer bundles	32.00 to 33.00
No. 2 bundles	22.00 to 23.00
Machine shop turn.	14.00 to 15.00
Cast iron borings	16.00 to 17.00
Shoveling turnings	17.00 to 18.00
No. 1 RR hvy. melting	34.00 to 35.00
Rails, random lengths	40.00 to 41.00
Rails, 18 in. and under	46.00 to 47.00
Angles and splice bars	40.00 to 41.00
Std. steel car axles	43.00 to 44.00
RR specialties	42.00 to 43.00
Cupola cast.	42.00 to 43.00
Heavy breakable cast.	32.00 to 33.00
Cast iron brake shoes	37.00 to 38.00
Stove plate	37.00 to 38.00
Cast iron car wheels	32.00 to 33.00
Rerolling rails	46.00 to 47.00
Unstripped motor blocks	32.00 to 33.00

Boston

Brokers buying prices per gross ton, on cars:

No. 1 hvy. melting	$23.00 to $24.00
No. 2 hvy. melting	20.00 to 21.00
No. 1 dealer bundles	23.00 to 24.00
No. 2 bundles	14.00 to 15.00
No. 1 busheling	22.00 to 23.00
Elec. furnace, 3 ft & under	29.00 to 30.00
Machine shop turn.	8.50 to 9.50
Mixed bor. and short turn.	9.50 to 10.50
Shoveling turnings	10.00 to 11.00
Clean cast. chem. borings	16.00 to 17.00
No. 1 machinery cast.	32.00 to 33.00
Mixed cupola cast.	27.00 to 28.00
Heavy breakable cast.	25.00 to 26.00
Stove plate	26.00 to 27.00
Unstripped motor blocks	26.00 to 27.00

New York

Brokers buying prices per gross ton, on cars:

No. 1 hvy. melting	$28.00 to $29.00
No. 2 hvy. melting	24.00 to 25.00
No. 2 dealer bundles	17.00 to 18.00
Machine shop turn.	11.00 to 12.00
Mixed bor. and turn.	13.00 to 14.00
Shoveling turnings	15.00 to 16.00
Clean cast. chem. borings	23.00 to 24.00
No. 1 machinery cast.	34.00 to 35.00
Mixed yard cast.	29.00 to 30.00
Charging box cast.	30.00 to 31.00
Heavy breakable cast.	30.00 to 31.00
Unstripped motor blocks	27.00 to 28.00

Birmingham

No. 1 hvy. melting	$29.00 to $30.00
No. 2 hvy. melting	24.00 to 25.00
No. 1 dealer bundles	29.00 to 30.00
No. 2 bundles	16.00 to 17.00
No. 1 busheling	29.00 to 30.00
Machine shop turn.	22.00 to 23.00
Shoveling turnings	23.00 to 24.00
Cast iron borings	12.00 to 13.00
Electric furnace bundles	36.00 to 37.00
Elec. furnace, 3 ft & under	35.00 to 36.00
Bar crops and plate	39.00 to 40.00
Structural and plate, 2 ft	39.00 to 40.00
No. 1 RR hvy. melting	34.00 to 35.00
Scrap rails, random lgth.	41.00 to 42.00
Rails, 18 in. and under	48.00 to 49.00
Angles & splice bars	41.00 to 42.00
Rerolling rails	48.00 to 49.00
No. 1 cupola cast.	49.00 to 50.00
Stove plate	48.00 to 49.00
Charging box cast.	22.00 to 23.00
Cast iron car wheels	36.00 to 37.00
Unstripped motor blocks	39.00 to 40.00

Cincinnati

Brokers buying prices per gross ton, on cars:

No. 1 hvy. melting	$28.00 to $29.00
No. 2 hvy. melting	23.50 to 24.50
No. 1 dealer bundles	28.00 to 29.00
No. 2 bundles	22.00 to 23.00
Machine shop turn.	13.00 to 14.00
Mixed bor. and turn.	15.00 to 16.00
Shoveling turnings	16.00 to 17.00
Cast iron borings	15.00 to 16.00
Low phos., 18 in. and under	37.00 to 38.00
Rails, random length	42.00 to 43.00
Rails, 18 in. and under	53.00 to 54.00
No. 1 cupola cast.	35.00 to 37.00
Hvy. breakable cast.	33.00 to 34.00
Drop broken cast.	47.00 to 48.00

San Francisco

No. 1 hvy. melting	$32.00
No. 2 hvy. melting	30.00
No. 1 dealer bundles	28.00
No. 2 bundles	22.00
Machine shop turn.	15.00
Cast iron borings	15.00
No. 1 RR hvy. melting	32.00
No. 1 cupola cast.	42.00

Los Angeles

No. 1 hvy. melting	$32.00
No. 2 hvy. melting	30.00
No. 1 dealer bundles	28.00
No. 2 bundles	20.00
Machine shop turn.	9.00
Shoveling turnings	11.00
Cast iron borings	11.00
Elec. furn. 1 ft and under (foundry)	43.00
No. 1 RR hvy. melting	32.00
No. 1 cupola cast	38.00

Seattle

No. 1 hvy. melting	$30.00
No. 2 hvy. melting	28.00
No. 2 bundles	24.00
No. 1 cupola cast	36.00
Mixed yard cast.	36.00

Hamilton, Ont.

No. 1 hvy. melting	$32.00
No. 2 hvy. melting	27.00
No. 1 dealer bundles	32.00
No. 2 bundles	22.00
Mixed steel scrap	27.00
Busheling	22.00
Bush., new fact, prep'd	32.00
Bush., new fact, unprep'd	26.00
Machine shop turn.	17.00
Short steel turn.	21.00
Mixed bor. and turn.	17.00
Rails, rerolling	41.00
Cast scrap	$44.00 to 47.00

Lower Prices Won't Help Copper

Copper producers cut their prices to 25¢ per lb; custom smelters drop to 24½¢.

Neither expects any boost in buying.

Both are trying to ride out the squeeze without losing any more ground.

▪ The copper industry is manfully tugging in its belt to try to keep its sagging markets from falling further.

On Monday, Kennecott Copper Co. dropped its price 2¢ per lb, to 25¢. Phelps Dodge followed the same day, the others soon after.

Major custom smelters lowered their price by ½¢ per lb, to 24½¢.

Chile announced she would permit her major mines, operated by U. S. subsidiaries, to cut production 10 pct.

See no New Buying—These efforts are stop gap measures. Neither custom smelters nor producers envision any noticeable increase in business because of the lower price. In fact, it's difficult to find anyone in the copper industry who believes anything can be done by the producers and sellers to breathe any enthusiasm into the market.

A representative of a producer suggests that the price slashes, and just about anything the domestic industry does in the first half, is to keep the situation from degenerating any further. He points out that the market in London had reached the point where metal could be bought and shipped to the U. S. at much less than even the custom smelters' price.

Fabricators' Pressure — Pressure from the fabricating subsidiaries helped push the producer price down. The mills are also in a scramble. When the copper they buy from the parent company costs too much in excess of other sellers' prices the subsidiaries are at a serious competitive disadvantage.

Reports dribbling in from Chile indicate output reduction is a tentative move. The Chileans have the lowest operating costs of any country. Observers say the Chileans are hoping world production will be unofficially regulated to demand. This of course will mean further cutbacks in other producing countries. If this doesn't happen Chilean production is expected to resume previous levels.

Industry Opinion — Here's the consensus throughout the U. S. copper and brass industry: Things won't get much better for us until the whole economy shows signs of recovery. The best policy is to play close to the vest to minimize the effects of the current squeeze.

Many are still hopeful of a spring upturn in general business and particularly among some of the major customers.

Magnesium

The Magnesium Assn. reports shipments of both ingots and wrought forms in November were off from the previous month, and from the same month in 1956.

The declines were called not unexpected. The association doesn't believe they will be enough to prevent total shipments in 1957 from hitting a new high.

(net tons)	Wrought	Ingots
Nov. 1957	615	5823
Oct. 1957	726	6735
Nov. 1956	1070	6818

Aluminum

The annual survey of aluminum in passenger cars, by Aluminum Co. of America, is good news for the industry.

Alcoa reports that 1958 models will use an average of 52.40 lb of aluminum per car. This is 29 pct more than the 40 lb the average 1957 model contained.

Figuring auto production at about 5.5 million units this year Alcoa says Detroit will buy 288 million lb of aluminum.

Here's where Alcoa says the aluminum will go:

Trim	**9 lb**
Automatic transmissions	**19.75 lb**
Engine parts	**16.78 lb**
Miscellaneous (power brakes, steering)	**6.87 lb**
Total per car	**52.40 lb**

But overall, there's some gloom throughout the industry, in spite of specific gains in individual markets.

Some cutbacks in industry expansion plans have been disclosed recently.

Tin prices for the week: Jan. 8—93.75; Jan. 9—93.75; Jan.10—93.75; Jan. 13—93.50; Jan. 14—93.50.*

* Estimate

Primary Prices

(cents per lb)	Current price	last price	date of change
Aluminum pig	28.00	25.00	8/1/57
Aluminum ingot	28.10	27.10	8/1/57
Copper (E)	25.00	27.00	1/13 58
Copper (CS)	24.50	25.00	1 13 58
Copper (L)	25.00	27.00	1 13 58
Lead, St. L.	12.80	13.30	12/2/57
Lead, N. Y.	13.00	13.50	12/2/57
Magnesium ingot	38.00	34.00	8/13/58
Magnesium pig	35.25	33.75	8/13/58
Nickel	74.00	84.50	12/6/58
Titanium sponge	165-250	165-225	8/5/57
Zinc, E. St. L.	10.00	10.50	7/1/57
Zinc, N. Y.	10.50	11.00	7/1/57

ALUMINUM: 99% ingot frt allwd. COPPER: (E) = electrolytic, (CS) = custom smelters, electrolytic. (L) = lake. LEAD: common grade. MAGNESIUM: 99.8% pig, Velasco, Tex. NICKEL: Port Colbourne, Canada. ZINC: prime western. TIN: see above; other primary prices, pg. 115.

MILL PRODUCTS

(Cents per lb unless otherwise noted)

ALUMINUM

(Base 30,000 lb, f.o.b. ship. pt., frt. allowed)

Flat Sheet (Mill Finish) and Plate
("F" temper except 6061-0)

Alloy	.032	.081	.136-.249	.250-3
1100, 3003	46.6	44.3	43.6	42.7
5052	54.0	48.9	47.2	45.4
6061-0	51.4	47.0	45.2	45.1

Extruded Solid Shapes

Factor	6063 T-5	6062 T-6
6-8	45.0-46.8	60.4-64.1
12-14	45.7-47.2	61.3-65.8
24-26	49.0-49.5	72.1-76.8
36-38	58.0-58.6	96.2-99.8

Screw Machine Stock—2011-T-3

Size*	¾	⅞-1⅜	1¼-1	1⅛-1½
Price	63.0	62.5	61.0	58.6

Roofing Sheet, Corrugated
(Per sheet, 26" wide base, 16,000 lb)

Length"→	72	96	120	144
.019 gage	$1.420	$1.893	$2.367	$2.839
.024 gage	1.774	2.366	2.957	3.549

MAGNESIUM

(F.o.b. shipping Pt., carload frt. allowed)

Sheet and Plate

Type↓ Gage→	.250-3.00	.250-2.00	.188	.081	.032
AZ31B Stand. Grade	.....	67.9	69.0	77.9	108.1
AZ31B Spec.	.....	93.3	95.7	108.7	171.3
Tread Plate	.....	70.6	71.7	.....	.....
Tooling Plate	73.0	.....	.....	.....	.....

Extruded Shapes

factor→	6-8	12-14	24-26	36-38
Comm. Grade (AZ31C)	69.6	70.7	75.6	89.2
Spec. Grade... (AZ31B)	84.6	85.7	90.6	104.2

Alloy Ingot

AZ91B (Die Casting) ..... 37.25 (delivered)
AZ63A, AZ92A, AZ91C (Sand Casting) 40.75 (Velasco, Tex.)

NICKEL, MONEL, INCONEL

(Base prices, f.o.b. mill)

	"A" Nickel	Monel	Inconel
Sheet, CR	126	106	128
Strip, CR	124	108	138
Rod, bar, HR	107	89	109
Angles, HR	107	89	109
Plates, HR	120	105	121
Seamless tube	157	129	200
Shot, blocks	...	87	...

COPPER, BRASS, BRONZE

(Freight included in 5000 lbs)

	Sheet	Wire	Red	Tube
Copper	50.13	.....	47.36	50.32
Brass, 70/30	44.02	44.56	45.26	46.93
Brass, Low	46.50	47.04	46.44	49.31
Brass, R L	47.37	47.91	47.31	50.18
Brass, Naval	48.27	.....	42.58	51.68
Munts Metal	46.39	.....	42.20	.....
Comm. Bs.	48.78	49.32	48.72	51.34
Mang. Bs.	52.01	.....	46.11	.....
Phos. Bs. 5%	69.07	.....	69.57	.....

Free Cutting Brass Rod 32.30

TITANIUM

(10,000 lb base, f.o.b. mill)

Sheet and strip, commercially pure, $9.50-$10.60; alloy, $14.75; Plate, HR, commercially pure, $8.00-$8.75; alloy, $10.75. Wire, rolled and/or drawn, commercially pure, $7.50-$8.00; alloy, $10.00; Bar, HR or forged, commercially pure, $6.15-$6.40; alloy, $6.15-$6.35; billets, HR, commercially pure, $6.00-$6.25; alloy, $6.00-$6.20.

PRIMARY METAL

(Cents per lb unless otherwise noted)

Antimony, American, Laredo, Tex.. 33.50
Beryllium aluminum 5% Be, Dollar per lb contained Be $74.75
Beryllium copper, per lb conta'd Be. $43.00
Beryllium 97% lump or beads, f.o.b. Cleveland, Reading $71.50
Bismuth, ton lots ..... $ 2.25
Cadmium, del'd ..... $ 1.55
Calcium, 99.9%, small lots ..... $ 4.55
Chromium, 99.8% metallic basis ... $ 1.31
Cobalt, 97-99% (per lb) ... $2.00 to $2.07
Germanium, per gm, f.o.b. Miami, Okla., refined ..... 39.50 to 53.50
Gold, U. S. Treas, per troy oz. $35.00
Indium, 99.9%, dollars per troy oz.. $ 2.25
Iridium, dollars per troy oz. ... $80 to $90
Lithium, 98% ..... $11.00 to $14.00
Magnesium, sticks, 100 to 500 lb.... 59.00
Mercury, dollars per 76-lb flask, f.o.b. New York ..... $223 to $228
Nickel oxide sinter at Copper Cliff, Ont., contained nickel 71.25
Palladium, dollars per troy oz.. $23 to $24
Platinum, dollars per troy oz... $77 to $80
Rhodium ..... $120.00 to $125.00
Silver ingots (¢ per troy oz.) 89.875
Thorium, per kg. $43.00
Vanadium ..... $ 3.45
Zirconium sponge ..... $ 5.00

REMELTED METALS

Brass Ingot

(Cents per lb delivered, carloads)

85-5-5 ingot
No. 115 ..... 26.25
No. 120 ..... 25.25
No. 123 ..... 24.50
80-10-10 ingot
No. 395 ..... 30.25
No. 315 ..... 28.25
88-10-2 ingot
No. 210 ..... 37.25
No. 215 ..... 33.00
No. 245 ..... 29.75
Yellow ingot
No. 405 ..... 21.75
Manganese bronze
No. 421 ..... 23.50

Aluminum Ingot

(Cents per lb del'd 30,000 lb and over)

95-5 aluminum-silicon alloys
0.30 copper max. 25.75-26.50
0.60 copper max. 25.50-26.25
Piston alloys (No. 122 type).. 24.25-25.00
No. 12 alum. (No. 2 grade) ... 22.00-23.00
108 alloy 22.25-23.50
195 alloy 25.25-26.75
13 alloy (0.60 copper max.) .. 25.50-26.25
AXS-679 ..... 22.25-23.50

(Effective Jan. 13, 1958)

Steel deoxidizing aluminum, notch bar granulated or shot

Grade 1—95-97½% 23.00-24.00
Grade 2—92-95% 21.75-22.50
Grade 3—90-92% 20.50-21.50
Grade 4—85-90% 18.25-19.25

SCRAP METALS

Brass Mill Scrap

(Cents per pound, add 1¢ per lb for shipments of 20,000 lb and over)

	Heavy	Turnings
Copper	21	20¼
Yellow brass	16⅛	14½
Red brass	18⅝	17⅞
Comm. bronze	19¼	18½
Mang. bronze	14⅞	14⅛
Yellow brass rod ends	15⅞	

Customs Smelters Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire 19¾
No. 2 copper wire 18¼
Light copper 16
*Refinery brass 17¾
Copper bearing material 17¼
*Dry copper content.

Ingot Makers Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire 19¾
No. 2 copper wire 18¼
Light copper 16
No. 1 composition 18¼
No. 1 comp. turnings 17¾
Hvy. yellow brass solids 12½
Brass pipe 14½
Radiators 14¼

Aluminum

Mixed old cast. ..... 13 —13½
Mixed new clips ..... 15½—16
Mixed turnings, dry ..... 14 —14½

Dealers' Scrap

(Dealers' buying price f.o.b. New York in cents per pound)

Copper and Brass

No. 1 copper wire ..... 17½—18
No. 2 copper wire ..... 15½—16
Light copper ..... 14 —14½
Auto radiators (unsweated).. 11¾—12
No. 1 composition ..... 15 —15½
No. 1 composition turnings... 14½—15
Cocks and faucets ..... 11½—12
Clean heavy yellow brass ... 10½—11
Brass pipe ..... 12 —12½
New soft brass clippings .... 12½—13
No. 1 brass rod turnings .... 11 —11¼

Aluminum

Alum. pistons and struts .... 5½— 6
Aluminum crankcases ..... 10 —10½
1100 (2S) aluminum clippings 13½—14
Old sheet and utensils ..... 10 —10½
Borings and turnings ..... 6½— 7
Industrial castings ..... 10 —10½
2024 (24S) clippings ..... 11½—12

Zinc

New zinc clippings ..... 4 — 4½
Old zinc ..... 3 — 3¼
Zinc routings ..... 1¾— 2
Old die cast scrap ..... 1½— 1¾

Nickel and Monel

Pure nickel clippings 42-45
Clean nickel turnings 37-40
Nickel anodes 42-45
Nickel rod ends 42-45
New Monel clippings 28-29
Clean Monel turnings 20-23
Old sheet Monel 25-26
Nickel silver clippings, mixed. 18
Nickel silver turnings, mixed. 15

Lead

Soft scrap lead ..... 8½— 9
Battery plates (dry) ..... 3½— 3¾
Batteries, acid free ..... 2½— 2¾

Miscellaneous

Block tin ..... 75 —76
No. 1 pewter ..... 59 —60
Auto babbitt ..... 39 —40
Mixed common babbitt ..... 11 —11½
Solder joints ..... 14½—15
Siphon tops 42
Small foundry type ..... 12 —12¼
Monotype ..... 12 —12¼
Lino. and stereotype ..... 11 —11¼
Electrotype ..... 10 —10¼
Hand picked type shells ..... 7 — 7½
Lino. and stereo. dross ..... 3 — 3¼
Electro dross ..... 2½— 2¾

STEEL PRICES

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		BILLETS, BLOOMS, SLABS			PILING	SHAPES STRUCTURALS			STRIP					
		Carbon Rerolling Net Ton	Carbon Forging Net Ton	Alloy Net Ton	Sheet Steel	Carbon	Hi Str. Low Alloy	Carbon Wide Flange	Hot-rolled	Cold-rolled	Hi Str. H.R. Low Alloy	Hi Str. C.R. Low Alloy	Alloy Hot-rolled	Alloy Cold-rolled
EAST	Bethlehem, Pa.			$114.00 *B3*		5.325 *B3*	7.80 *B3*	5.325 *B3*						
	Buffalo, N. Y.	$77.50 *R3, B3*	$96.00 *R3, B3*	$114.00 *R3, B3*	6.225 *B3*	5.325 *B3*	7.80 *B3*	5.325 *B3*	4.925 *R3, B3*	7.15 *S10*	7.325 *B3*			
	Phila., Pa.									7.70 *P15*				
	Harrison, N. J.													15.05 *C11*
	Conshohocken, Pa.		$101.00 *A2*	$121.00 *A2*					4.975 *A2*	7.20 *A2*	7.325 *A2*			
	New Bedford, Mass.									7.60 *R6*				
	Johnstown, Pa.	$77.50 *B3*	$96.00 *B3*	$114.00 *B3*		5.325 *B3*	7.80 *B3*							
	Boston, Mass.									7.70 *T8*				15.40 *T8*
	New Haven, Conn.									7.60 *D1*				
	Baltimore, Md.									7.15 *T8*				
	Phoenixville, Pa.					5.325 *P2*		5.325 *P2*						
	Sparrows Pt., Md.								4.925 *B3*		7.325 *B3*			
	Bridgeport, Wallingford, Conn.			$114.00 *N8*						7.60 *W1*				
	Pawtucket, R. I. Worcester, Mass.									7.70 *N7* 7.70 *A5*				15.40 *N7* 15.20 *T8*
MIDDLE WEST	Alton, Ill.								5.125 *L1*					
	Ashland, Ky.								4.925 *A7*					
	Canton-Massillon, Dover, Ohio		$96.00 *R3*	$114.00 *R3, T5*						7.15 *G4*		10.45 *G4*		14.85 *C11*
	Chicago, Ill. Franklin Park, Ill. Evanston, Ill.	$77.50 *U1, R3*	$96.00 *U1, R3,W8*	$114.00 *U1, R3,W8*	6.225 *U1*	5.275 *U1, W8,P15*	7.75 *U1,Y1 W8*	5.275 *U1*	4.925 *W8, N4,A1*	7.25 *A1,T8 M8*			8.10 *W8, S9,I3*	15.05 *A1, S9,G4*
	Cleveland, Ohio									7.15 *A5,J3*		10.45 *A5*	8.10 *J3*	
	Detroit, Mich.			$114.00 *R3*					5.025 *G3, M2*	7.25 *M2,D1, D2,G3,P11*	7.425 *G3*	10.60 *D2* 10.55 *G3*	8.10 *G3*	
	Anderson, Ind.									7.15 *G4*				
	Duluth, Minn.													
	Gary, Ind. Harbor, Indiana	$77.50 *U1*	$96.00 *U1*	$114.00 *U1, Y1*		5.275 *U1, I3*	7.75 *U1, I3*	5.275 *I3*	4.925 *U1, I3,Y1*	7.15 *Y1*	7.325 *U1, I3,Y1*	10.60 *Y1*	8.10 *U1, Y1*	
	Sterling, Ill.	$77.50 *N4*				5.275 *N4*			5.025 *N4*					
	Indianapolis, Ind.									7.30 *J3*				15.20 *J3*
	Newport, Ky.												8.10 *A9*	
	Middletown, Ohio													
	Niles, Warren, Ohio Sharon, Pa.		$96.00 *S1, C10*	$114.00 *C10,S1*					4.925 *R3, S1*	7.15 *R3,T4 S1*	7.325 *R3, S1*	10.50 *S1* 10.45 *R3*	8.10 *S1*	15.05 *S1*
	Pittsburgh, Pa. Midland, Pa. Butler, Pa. Aliquippa, Pa.	$77.50 *U1, P6*	$96.00 *U1, C11,P6*	$114.00 *U1, C11,B7*	6.225 *U1*	5.275 *U1, J3*	7.75 *U1, J3*	5.275 *U1*	4.925 *P6*	7.15 *J3,B4, S7*			8.10 *S9*	15.05 *S9*
	Weirton, Wheeling, Follansbee, W. Va.				6.225 *W3*	5.275 *W3*			4.925 *W3*	7.15 *W3,F3*	7.325 *W3*	10.50 *W3*		
	Youngstown, Ohio	$77.50 *R3*	$96.00 *Y1, C10*	$114.00 *Y1*			7.75 *Y1*			7.15 *Y1,J3*	7.325 *U1, Y1*	10.65 *Y1*	8.10 *U1, Y1*	15.05 *J3* 10.65 *Y1*
WEST	Fontana, Cal.	$88.00 *K1*	$105.50 *K1*	$135.00 *K1*		6.075 *K1*	8.55 *K1*	6.225 *K1*	5.675 *K1*	9.00 *K1*				
	Geneva Utah		$96.00 *C7*			5.275 *C7*	7.75 *C7*							
	Kansas City, Mo.					5.375 *S2*	7.85 *S2*						8.35 *S2*	
	Los Angeles, Torrance, Cal.		$105.50 *B2*	$134.00 *B2*		5.975 *C7, B2*	8.45 *B2*		5.675 *C7, B2*	9.05 *J3*			9.30 *B2*	17.25 *J3*
	Minnequa, Colo.					5.575 *C6*			6.025 *C6*	9.10 *K1*				
	Portland, Ore.					6.025 *O2*								
	San Francisco, Niles, Pittsburg, Cal.		$105.50 *B2*			5.925 *B2*	8.40 *B2*		5.675 *C7, B2*					
	Seattle, Wash.		$109.50 *B2*			6.025 *B2*	8.50 *B2*		5.925 *B2*					
SOUTH	Atlanta, Ga.					5.475 *A8*			5.125 *A8*					
	Fairfield, Ala. City, Birmingham, Ala.	$77.50 *T2*	$96.00 *T2*			5.275 *T2, R3,C16*	7.75 *T2*		4.925 *T2, R3,C16*		7.325 *T2*			
	Houston, Lone Star, Texas		$101.00 *S2*	$119.00 *S2*		5.375 *S2*	7.85 *S2*						8.35 *S2*	

(Effective Jan. 13, 1958)

STEEL PRICES

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		SHEETS								WIRE ROD	TINPLATE†		BLACK PLATE
		Hot rolled *18* ga. & hvyr.	Cold-rolled	Galvanized	Enameling	Long Terne	Hi Str. Low Alloy H.R.	Hi Str. Low Alloy C.R.	Hi Str. Low Alloy Galv.		Cokes* *1.25*-lb. base box	Electro* *0.25* lb. base box	Holloware Enameling *29* ga.
EAST	Bethlehem, Pa.												
	Buffalo, N. Y.	4.925 *B3*	6.05 *B3*				7.275 *B3*	8.975 *B3*		6.15 *W6*			
	Claymont, Del.												
	Coatesville, Pa.												
	Conshohocken, Pa.	4.975 *A2*	6.10 *A2*				7.325 *A2*						
	Harrisburg, Pa.												
	Hartford, Conn.												
	Johnstown, Pa.									6.15 *B3*			
	Fairless, Pa.	4.975 *U1*	6.10 *U1*				7.325 *U1*	9.025 *U1*			$10.15 *U1*	$8.85 *U1*	
	New Haven, Conn.												
	Phoenixville, Pa.												
	Sparrows Pt., Md.	4.925 *B3*	6.05 *B3*	6.60 *B3*			7.275 *B3*	8.975 *B3*	9.725 *B3*	6.25 *B3*	$10.15 *B3*	$8.85 *B3*	
	Worcester, Mass.									6.45 *A5*			
	Trenton, N. J.												
MIDDLE WEST	Alton, Ill.									6.35 *L1*			
	Ashland, Ky	4.925 *A7*		6.60 *A7*	6.625 *A7*								
	Canton-Massillon, Dover, Ohio			6.60 *R3, R1*									
	Chicago, Joliet, Ill.	4.925 *W8, A1*					7.275 *U1*			6.15 *A5, R3,W8, N4, K2*			
	Sterling, Ill.									6.25 *N4, K2*			
	Cleveland, Ohio	4.925 *R3, J3*	6.05 *R3, J3*		6.625 *R3*		7.275 *R3, J3*	8.975 *R3, J3*		6.15 *A5*			
	Detroit, Mich.	5.025 *G3, M2*	6.15 *G3* 6.05 *M2*				7.375 *G3*	9.075 *G3*					
	Newport, Ky	4.925 *A1*	6.05 *A1*										
	Gary, Ind. Harbor, Indiana	4.925 *U1, I3,Y1*	6.05 *U1, I3,Y1*	6.60 *U1, I3*	6.625 *U1, I3,Y1*	7.00 *U1*	7.275 *U1, Y1,I3*	8.975 *U1, Y1*		6.15 *Y1*	$10.05 *U1, Y1*	$8.75 *I3, U1,Y1*	7.50 *U1, Y1*
	Granite City, Ill.	5.125 *G2*	6.25 *G2*	6.80 *G2*	6.825 *G2*							$8.85 *G2*	7.60 *G2*
	Kokomo, Ind.			6.70 *C9*						6.25 *C9*			
	Mansfield, Ohio		6.05 *E2*			7.00 *E2*							
	Middletown, Ohio		6.05 *A7*	6.60 *A7*	6.625 *A7*	7.00 *A7*							
	Niles, Warren, Ohio Sharon, Pa.	4.925 *R3, N3,S1*	6.05 *R3*	6.60 *R3*	6.625 *N3, S1*	7.00 *N3, S1,R3*	7.275 *R3*	8.975 *S1, R3*				$8.75 *R3*	
	Pittsburgh, Pa. Midland, Pa. Butler, Pa. Donora, Pa. Aliquippa, Pa.	4.925 *U1, J3,P6*	6.05 *U1, J3,P6*	6.60 *U1, J3*	6.625 *U1*		7.275 *U1, J3*	8.975 *U1, J3*	9.725 *U1*	6.15 *A5, J3,P6*	$10.05 *U1, J3*	$8.75 *U1, J3*	7.50 *U1, J3*
	Portsmouth, Ohio	4.925 *P7*	6.05 *P7*							6.15 *P7*			
	Weirton, Wheeling, Follansbee, W. Va.	4.925 *W3, W5*	6.05 *W3, F3,W5*	6.60 *W3, W5*		7.00 *W3, W5*	7.275 *W3*	8.975 *W3*			$10.05 *W5, W3*	$8.75 *W5, W3*	7.50 *W5*
	Youngstown, Ohio	4.925 *U1, Y1*	6.05 *Y1*		6.625 *Y1*		7.275 *Y1*	8.975 *Y1*		6.15 *Y1*			
WEST	Fontana Cal.	5.675 *K1*	7.30 *K1*				8.025 *K1*	10.275 *K1*			$10.80 *K1*	$9.50 *K1*	
	Geneva, Utah	5.025 *C7*											
	Kansas City, Mo.									6.40 *S2*			
	Los Angeles, Torrance, Cal.									6.95 *B2*			
	Minnequa, Colo.									6.40 *C6*			
	San Francisco, Niles, Pittsburgh, Cal.	5.625 *C7*	7.00 *C7*	7.35 *C7*						6.95 *C7*	$10.80 *C7*	$9.50 *C7*	
	Seattle, Wash.												
SOUTH	Atlanta, Ga.												
	Fairfield, Ala. Alabama City, Ala.	4.925 *T2, R3*	6.05 *T2, R3*	6.60 *T2, R3*						6.15 *T2, R3*	$10.15 *T2*	$8.85 *T2*	
	Houston, Tex.									6.40 *S2*			

† Special coated mfg. terne deduct 50¢ from 1.25-lb. coke base box price. Can-making quality blackplate 55 to 128 lb. deduct $2.20 from 1.25 lb. coke base box.

* COKES: 1.50-lb. add 25¢.
ELECTRO: 0.50-lb. add 25¢; 0.75-lb. add 65¢; 1.00-lb. add $1.00. Differential 1.00 lb., 0.25 lb. add 65¢.

(Effective Jan. 13, 1958)

STEEL PRICES

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		BARS						PLATES				WIRE
		Carbon† Steel	Reinforcing	Cold Finished	Alloy Hot-rolled	Alloy Cold Drawn	Hi Str. H.R. Low Alloy	Carbon Steel	Floor Plate	Alloy	Hi Str. Low Alloy	Mfrs'. Bright
EAST	Bethlehem, Pa.				6.475 *B3*	8.775 *B3*	7.925 *B3*					
	Buffalo, N. Y.	5.425 *R3,B3*	5.425 *R3,B3*	7.35 *B5*	6.475 *B3,R3*	8.775 *B3,B5*	7.925 *B3*	5.10 *B3*		7.20 *B3*		7.65 *W6*
	Claymont, Del.							5.10 *C4*		7.20 *C4*	7.625 *C4*	
	Coatesville, Pa.							5.10 *L4*		7.20 *L4*	7.925 *L4*	
	Conshohocken, Pa.							5.20 *A2*	6.175 *A2*	7.20 *A2*	7.625 *A2*	
	Harrisburg, Pa.							5.10 *P2*	6.275 *P2*			
	Milton, Pa.	5.575 *M7*	5.575 *M7*									
	Hartford, Conn.			7.80 *R3*		9.075 *R3*	7.925 *B3*					
	Johnstown, Pa.	5.425 *B3*	5.425 *B3*		6.475 *B3*			5.10 *B3*		7.20 *B3*	7.625 *B3*	7.65 *B3*
	Fairless, Pa.	5.575 *U1*	5.575 *U1*		6.625 *U1*							
	Newark, N. J. Camden, N. J.			7.75 *W10* 7.75 *P10*		8.95 *W10* 8.95 *P10*						
	Bridgeport, Conn. Putnam, Conn. Willimantic, Conn.			7.85 *W10* 7.80 *J3*	6.55 *N8*	8.925 *N8*						
	Sparrows Pt., Md.		5.425 *B3*					5.10 *B3*		7.20 *B3*	7.625 *B3*	7.75 *B3*
	Palmer, Worcester, Readville, Mass. Mansfield, Mass.			7.85 *B5,C14*		9.075 *A5,B5*						7.95 *A5, W6*
	Spring City, Pa.			7.75 *K4*		8.95 *K4*						
MIDDLE WEST	Alton, Ill.	5.625 *L1*										7.85 *L1*
	Ashland, Newport, Ky.							5.10 *A7,A1*		7.20 *A1*		
	Canton, Massillon, Ohio			7.30 *R3,R2*	6.475 *R3,T5*	8.775 *R3,R2, T5*						
	Chicago, Joliet, Waukegan, Ill. Harvey, Ill.	5.425 *U1,R3, W8,N4,P13*	5.425 *U1,R3, N4,P13*	7.30 *A5, W10,W8 B5,L2,N9*	6.475 *U1,R3, W8*	8.775 *A5, W10,W8 L2,N8,B5*	7.925 *U1,W8*	5.10 *U1,A1, W8,I3*	6.175 *U1*	7.20 *U1,W8*	7.625 *U1,W8*	7.65 *A5,R3, W8,N4, K2,W7*
	Cleveland, Ohio Elyria, Ohio	5.425 *R3*	5.425 *R3*	7.30 *A5,C13 C18*		8.775 *A5, C13, C18*	7.925 *R3*	5.20 *R3,J3*	6.175 *J3*		7.625 *R3, J3*	7.65 *A5, C13*
	Detroit, Mich.	5.525 *G3*	5.775 *G3*	7.55 *P3* 7.50 *P8,B5*	6.475 *R5* 6.575 *G3*	8.775 *R5* 8.975 *B5,P3, P8*	8.025 *G3*	5.20 *G3*		7.35 *G3*		
	Duluth, Minn.											7.65 *A5*
	Gary, Ind. Harbor, Crawfordsville, Hammond, Ind.	5.425 *U1,I3, Y1*	5.425 *U1,I3, Y1*	7.30 *R3,J3*	6.475 *U1,I3, Y1*	8.775 *R3,M4*	7.925 *U1, Y1*	5.10 *U1,I3, Y1*	6.175 *J3,I3*	7.20 *U1,Y1*	7.625 *U1, Y1,I3*	7.75 *M4*
	Granite City, Ill.							5.30 *G2*				
	Kokomo, Ind											7.75 *C9*
	Sterling, Ill.	5.525 *N4*	5.525 *N4*					5.10 *N4*				7.75 *K2*
	Niles, Warren, Ohio Sharon, Pa.			7.30 *C10*	6.475 *C10,S1*	8.775 *C10*	7.925 *S1*	5.10 *R3,S1*		7.20 *S1*	7.625 *R3, S1*	
	Pittsburgh, Midland, Donora, Aliquippa, Pa.	5.425 *U1,J3*	5.425 *U1,J3*	7.30 *A5,B4, R3,J3,C11, W10,S9,C8*	6.475 *U1,J3, C11,B7*	8.775 *A5, W10,R3,S9, C11,C8*	7.925 *U1,J3*	5.10 *U1,J3*	6.175 *U1*	7.20 *U1,J3, B7*	7.625 *U1,J3, B7*	7.65 *A5, J3,P6*
	Portsmouth, Ohio											7.65 *P7*
	Weirton, Wheeling, Follansbee, W. Va.							5.10 *W5*				
	Youngstown, Ohio	5.425 *U1,R3, Y1*	5.425 *U1,R3, Y1*	7.30 *A5,Y1, F2*	6.475 *U1,Y1*	8.775 *Y1,F2*	7.925 *U1,Y1*	5.10 *U1,R3, Y1*		7.20 *Y1*	7.625 *U1, R3,Y1*	7.65 *Y1*
WEST	Emeryville, Cal. Fontana, Cal.	6.175 *J5* 6.125 *K1*	6.175 *J5* 6.125 *K1*		7.525 *K1*		8.625 *K1*	5.90 *K1*		8.00 *K1*	8.425 *K1*	
	Geneva, Utah							5.10 *C7*			7.625 *C7*	
	Kansas City, Mo.	5.675 *S2*	5.675 *S2*		6.725 *S2*		8.175 *S2*					7.90 *S2*
	Los Angeles, Torrance, Cal.	6.125 *C7,B2*	6.125 *C7,B2*	8.75 *R3,P14*	7.525 *B2*	10.65 *P14*	8.625 *B2*					8.60 *B2*
	Minnequa, Colo.	5.875 *C6*	5.875 *C6*					5.95 *C6*				7.90 *C6*
	Portland, Ore.	6.175 *O2*	6.175 *O2*									
	San Francisco, Niles, Pittsburg, Cal.	6.125 *C7* 6.175 *B2*	6.125 *C7* 6.175 *B2*				8.675 *B2*					8.60 *C7,C6*
	Seattle Wash.	6.175 *B2,N6*	6.175 *B2*				8.675 *B2*	6.00 *B2*		8.10 *B2*	8.525 *B2*	
SOUTH	Atlanta, Ga.	5.625 *A8*	5.625 *A8*									7.85 *A8*
	Fairfield, Ala. City, Birmingham, Ala.	5.425 *T2,R3, C16*	5.425 *T2,R3, C16,S11*	7.90 *C16*			7.925 *T2*	5.10 *T2,R3*			7.625 *T2*	7.65 *T2,R3*
	Houston, Ft. Worth, Lone Star, Tex.	5.675 *S2*	5.675 *S2*		6.725 *S2*		8.175 *S2*	5.20 *S2* 5.45 *L3*		7.30 *S2*	7.725 *S2*	7.90 *S2*

(Effective Jan. 13, 1958)

† Merchant Quality—Special Quality 35¢ higher.

STEEL PRICES

Key to Steel Producers

With Principal Offices

A1 Acme Steel Co., Chicago
A2 Alan Wood Steel Co., Conshohocken, Pa.
A3 Allegheny Ludlum Steel Corp., Pittsburgh
A4 American Cladmetals Co., Carnegie, Pa.
A5 American Steel & Wire Div., Cleveland
A6 Angel Nail & Chaplet Co., Cleveland
A7 Armco Steel Corp., Middletown, Ohio
A8 Atlantic Steel Co., Atlanta, Ga.
A9 Acme-Newport Steel Co., Newport, Ky.

B1 Babcock & Wilcox Tube Div., Beaver Falls, Pa.
B2 Bethlehem Pacific Coast Steel Corp., San Francisco
B3 Bethlehem Steel Co., Bethlehem, Pa.
B4 Blair Strip Steel Co., New Castle, Pa.
B5 Bliss & Laughlin, Inc., Harvey, Ill.
B6 Brook Plant, Wickwire Spencer Steel Div., Birdsboro, Pa.
B7 A. M. Byers, Pittsburgh
B8 Braeburn Alloy Steel Corp., Braeburn, Pa.

C1 Calstrip Steel Corp., Los Angeles
C2 Carpenter Steel Co., Reading, Pa.
C3 Central Iron & Steel Co., Harrisburg, Pa.
C4 Claymont Products Dept., Claymont, Del.
C6 Colorado Fuel & Iron Corp., Denver
C7 Columbia Geneva Steel Div., San Francisco
C8 Columbia Steel & Shafting Co., Pittsburgh
C9 Continental Steel Corp., Kokomo, Ind.
C10 Copperweld Steel Co., Pittsburgh, Pa.
C11 Crucible Steel Co. of America, Pittsburgh
C12 Cumberland Steel Co., Cumberland, Md.
C13 Cuyahoga Steel & Wire Co., Cleveland
C14 Compressed Steel Shafting Co., Readville, Mass.
C15 G. O. Carlson, Inc., Thorndale, Pa.
C16 Connors Steel Div., Birmingham
C17 Chester Blast Furnace, Inc., Chester, Pa.
C18 Cold Drawn Steel Plant, Western Automatic Machine Screw Co., Elyria, O.

D1 Detroit Steel Corp., Detroit
D2 Dearborn Div., Sharon Steel Corp.
D3 Driver Harris Co., Harrison, N. J.
D4 Dickson Weatherproof Nail Co., Evanston, Ill.

E1 Eastern Stainless Steel Corp., Baltimore
E2 Empire Steel Co., Mansfield, O.

F1 Firth Sterling, Inc., McKeesport, Pa.
F2 Fitzsimons Steel Corp., Youngstown
F3 Follansbee Steel Corp., Follansbee, W. Va.

G2 Granite City Steel Co., Granite City, Ill.
G3 Great Lakes Steel Corp., Detroit
G4 Greer Steel Co., Dover, O.

H1 Hanna Furnace Corp., Detroit

I2 Ingersoll Steel Div., Chicago
I3 Inland Steel Co., Chicago
I4 Interlake Iron Corp., Cleveland

J1 Jackson Iron & Steel Co., Jackson, O.
J2 Jessop Steel Corp., Washington, Pa.
J3 Jones & Laughlin Steel Corp., Pittsburgh
J4 Joslyn Mfg. & Supply Co., Chicago
J5 Judson Steel Corp., Emeryville, Calif.

K1 Kaiser Steel Corp., Fontana, Cal.
K2 Keystone Steel & Wire Co., Peoria
K3 Koppers Co., Granite City, Ill.
K4 Keystone Drawn Steel Co., Spring City, Pa.

L1 Laclede Steel Co., St. Louis
L2 La Salle Steel Co., Chicago
L3 Lone Star Steel Co., Dallas
L4 Lukens Steel Co., Coatesville, Pa.

M1 Mahoning Valley Steel Co., Niles, O.
M2 McLouth Steel Corp., Detroit
M3 Mercer Tube & Mfg. Co., Sharon, Pa.
M4 Mid States Steel & Wire Co., Crawfordsville, Ind.
M6 Mystic Iron Works, Everett, Mass.
M7 Milton Steel Products Div., Milton, Pa.
M8 Mill Strip Products Co., Evanston, Ill.

N1 National Supply Co., Pittsburgh
N2 National Tube Div., Pittsburgh
N3 Niles Rolling Mill Div., Niles, O.
N4 Northwestern Steel & Wire Co., Sterling, Ill.
N6 Northwest Steel Rolling Mills, Seattle
N7 Newman Crosby Steel Co., Pawtucket, R. I.
N8 Carpenter Steel of New England, Inc., Bridgeport, Conn.
N9 Nelson Steel & Wire Co.

O1 Oliver Iron & Steel Co., Pittsburgh
O2 Oregon Steel Mills, Portland

P1 Page Steel & Wire Div., Monessen, Pa.
P2 Phoenix Iron & Steel Co., Phoenixville, Pa.
P3 Pilgrim Drawn Steel Div., Plymouth, Mich.
P4 Pittsburgh Coke & Chemical Co., Pittsburgh
P5 Pittsburgh Screw & Bolt Co., Pittsburgh
P6 Pittsburgh Steel Co., Pittsburgh
P7 Portsmouth Div., Detroit Steel Corp., Detroit
P8 Plymouth Steel Co., Detroit
P9 Pacific States Steel Co., Niles, Cal.
P10 Precision Drawn Steel Co., Camden, N. J.
P11 Production Steel Strip Corp., Detroit
P13 Phoenix Mfg. Co., Joliet, Ill.
P14 Pacific Tube Co.
P15 Philadelphia Steel and Wire Corp.

R1 Reeves Steel & Mfg. Co., Dover, O.
R2 Reliance Div., Eaton Mfg. Co., Massillon, O.
R3 Republic Steel Corp., Cleveland
R4 Roebling Sons Co., John A., Trenton, N. J.
R5 J. & L. Steel Co., Stainless Div.
R6 Rodney Metals, Inc., New Bedford, Mass.
R7 Rome Strip Steel Co., Rome, N. Y.

S1 Sharon Steel Corp., Sharon, Pa.
S2 Sheffield Steel Div., Kansas City
S3 Shenango Furnace Co., Pittsburgh
S4 Simonds Saw and Steel Co., Fitchburg, Mass.
S5 Sweet's Steel Co., Williamsport, Pa.
S6 Standard Forging Corp., Chicago
S7 Stanley Works, New Britain, Conn.
S8 Superior Drawn Steel Co., Monaca, Pa.
S9 Superior Steel Corp., Carnegie, Pa.
S10 Seneca Steel Service, Buffalo
S11 Southern Electric Steel Co., Birmingham

T1 Tonawanda Iron Div., N. Tonawanda, N. Y.
T2 Tennessee Coal & Iron Div., Fairfield
T3 Tennessee Products & Chem. Corp., Nashville
T4 Thomas Strip Div., Warren, O.
T5 Timken Steel & Tube Div., Canton, O.
T7 Texas Steel Co., Fort Worth
T8 Thompson Wire Co., Boston

U1 United States Steel Corp., Pittsburgh
U2 Universal-Cyclops Steel Corp., Bridgeville, Pa.
U3 Ulbrich Stainless Steels, Wallingford, Conn.
U4 U. S. Pipe & Foundry Co., Birmingham

W1 Wallingford Steel Co., Wallingford, Conn.
W2 Washington Steel Corp., Washington, Pa.
W3 Weirton Steel Co., Weirton, W. Va.
W4 Wheatland Tube Co., Wheatland, Pa.
W5 Wheeling Steel Corp., Wheeling, W. Va.
W6 Wickwire Spencer Steel Div., Buffalo
W7 Wilson Steel & Wire Co., Chicago
W8 Wisconsin Steel Div., S. Chicago, Ill.
W9 Woodward Iron Co., Woodward, Ala.
W10 Wyckoff Steel Co., Pittsburgh
W12 Wallace Barnes Steel Div., Bristol, Conn.

Y1 Youngstown Sheet & Tube Co., Youngstown, O.

PIPE AND TUBING

Base discounts (pct) f.o.b. mills. Base price about $200 per net ton.

	BUTTWELD														SEAMLESS							
	½ In.		¾ In.		1 In.		1¼ In.		1½ In.		2 In.		2½-3 In.		2 In.		2½ In.		3 In.		3½-4 In.	
STANDARD T. & C.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.
Sparrows Pt. *B3*	3.25	+12.0	6.25	+8.0	9.75	+3.50	12.25	+2.75	12.75	+1.75	13.25	+1.25	14.75	+1.50								
Youngstown *R3*	5.25	+10.0	8.25	+6.0	11.75	+1.50	14.25	+0.75	14.75	0.25	15.25	0.75	16.75	0.50								
Fontana *K1*	+8.25	+23.5	+5.25	+19.5	+1.75	+15.00	0.75	+14.25	1.25	+13.25	1.75	+12.75	3.25	+13.00								
Pittsburgh *J3*	5.25	+10.0	8.25	+6.0	11.75	+1.50	14.25	+0.75	14.75	0.25	15.25	0.75	16.75	0.50	*9.25	+24.25	*2.75	+19.50	*0.25	+17.0	1.25	+15.50
Alton, Ill. *L1*	3.25	+12.0	6.25	+8.0	9.75	+3.50	12.25	+2.75	12.75	+1.75	13.25	+1.25	14.75	+1.50								
Sharon *M3*	5.25	+10.0	8.25	+6.0	11.75	+1.50	14.25	+0.75	14.75	0.25	15.25	0.75	16.75	0.50								
Fairless *N2*	3.25	+12.0	6.25	+8.0	9.75	+3.50	12.25	+2.75	12.75	+1.75	13.25	+1.25	14.75	+1.50								
Pittsburgh *N1*	5.25	+10.0	8.25	+6.0	11.75	+1.50	14.25	+0.75	14.75	0.25	15.25	0.75	16.75	0.50	*9.25	+24.25	*2.75	+19.50	*0.25	+17.0	1.25	+15.50
Wheeling *W5*	5.25	+10.0	8.25	+6.0	11.75	+1.50	14.25	+0.75	14.75	0.25	15.25	0.75	16.75	0.50								
Wheatland *W4*	5.25	+10.0	8.25	+6.0	11.75	+1.50	14.25	+0.75	14.75	0.25	15.25	0.75	16.75	0.50								
Youngstown *Y1*	5.25	+10.0	8.25	+6.0	11.75	+1.50	14.25	+0.75	14.75	0.25	15.25	0.75	16.75	0.50	*9.25	+24.25	*2.75	+19.50	*0.25	+17.0	1.25	+15.50
Indiana Harbor *Y1*	4.25	+11.0	7.25	+7.0	10.75	+2.50	13.25	+1.75	13.25	+0.75	14.25	+0.25	15.75	+1.00								
Lorain *N2*	5.25	+10.0	8.25	+6.0	11.75	+1.50	14.25	+0.75	14.75	0.25	15.25	0.75	16.75	0.50	*9.25	+24.25	*2.75	+19.50	*0.25	+17.0	1.25	+15.50
EXTRA STRONG PLAIN ENDS																						
Sparrows Pt. *B3*	7.75	+6.0	11.75	+2.0	14.75	2.50	15.25	1.25	15.75	2.25	16.25	2.75	16.75	1.50								
Youngstown *R3*	9.75	+4.0	13.75	list	16.75	4.50	17.25	3.25	17.75	4.25	18.25	4.75	18.75	3.50								
Fairless *N2*	7.75	+6.0	11.75	+2.0	14.75	2.50	15.25	1.25	15.75	2.25	16.25	2.75	16.75	1.50								
Fontana *K1*	+3.75		0.25		3.25		3.75		4.25		4.75		5.25									
Pittsburgh *J3*	9.75	+4.0	13.75	list	16.75	4.50	17.25	3.25	17.75	4.25	18.25	4.75	18.75	3.50	*7.75	+21.75	*0.25	+16.0	2.25	+13.50	7.25	+8.50
Alton, Ill. *L1*	7.75	+6.0	11.75	+2.0	14.75	2.50	15.25	1.25	15.75	2.25	16.25	2.75	16.75	1.50								
Sharon *M3*	9.75	+4.0	13.75	list	16.75	4.50	17.25	3.25	17.75	4.25	18.25	4.75	18.75	3.50								
Pittsburgh *N1*	9.75	+4.0	13.75	list	16.75	4.50	17.25	3.25	17.75	4.25	18.25	4.75	18.75	3.50	*7.75	+21.75	*0.25	+16.0	2.25	+13.50	7.25	+8.50
Wheeling *W5*	9.75	+4.0	13.75	list	16.75	4.50	17.25	3.25	17.75	4.25	18.25	4.75	18.75	3.50								
Wheatland *W4*	9.75	+4.0	13.75	list	16.75	4.50	17.25	3.25	17.75	4.25	18.25	4.75	18.75	3.50								
Youngstown *Y1*	9.75	+4.0	13.75	list	16.75	4.50	17.25	3.25	17.75	4.25	18.25	4.75	18.75	3.50	*7.75	+21.75	*0.25	+16.0	2.25	+13.50	7.25	+8.50
Indiana Harbor *Y1*	8.75	+5.0	12.75	+1.0	15.75	3.50	16.25	2.25	16.75	3.25	17.25	3.75	17.75	2.50								
Lorain *N2*	9.75	+4.0	13.75	list	16.75	4.50	17.25	3.25	17.75	4.25	18.25	4.75	18.75	3.50	*7.75	+21.75	*0.25	+16.0	2.25	+13.50	7.25	+8.50

Threads only, buttweld and seamless 2½ pt. higher discount. Plain ends, buttweld and seamless, 3-in. and under, 5½ pt. higher discount.
Galvanized discounts based on zinc price range of over 9¢ to 11¢ per lb. East St. Louis. For each 2¢ change in zinc, discounts vary as follows: ½, ¾ and 1-in., 2 pt.; 1¼, 1½ and 2-in., 1½ pt.; 2½ and 3-in., 1 pt., e.g., zinc price range of over 13¢ to 15¢ would lower discounts on 2½ and 3-in. pipe by 2 points; zinc price in range over 7¢ to 9¢ would increase discounts. East St. Louis zinc price now 10¢ per lb.

(Effective Jan. 13, 1958)

TOOL STEEL

F.o.b. mill

W	Cr	V	Mo	Co	per lb	SAE
18	4	1	—	—	$1.795	T-1
18	4	1	—	5	2.50	T-4
18	4	2	—	—	1.96	T-2
1.5	4	1.5	8	—	1.155	M-1
6	4	3	6	—	1.545	M-3
6	4	2	5	—	1.30	M-2
High-carbon chromium					.925	D-3, D-5
Oil hardened manganese					.475	O-2
Special carbon					.36	W-1
Extra carbon					.36	W-1
Regular carbon					.305	W-1

Warehouse prices on and east of Mississippi are 4¢ per lb higher. West of Mississippi, 6¢ higher.

CLAD STEEL

Base prices, cents per lb f.o.b.

	Cladding	Plate (*A3, J2, L4, C4*) 10 pct	15 pct	20 pct	Sheet (*I2*) 20 pct
Stainless Type	302				37.50
	304	37.95	42.25	46.70	40.00
	316	44.40	49.50	54.50	58.75
	321	40.05	44.60	49.30	47.25
	347	42.40	47.55	52.80	57.00
	405	29.85	33.35	36.85	
	410	29.55	33.10	36.70	
	430	29.80	33.55	37.25	

CR Strip (*S9*) Copper, 10 pct, 2 sides, 40.25; 1 side, 33.95.

RAILS, TRACK SUPPLIES

F.o.b. Mill Cents Per Lb	No. 1 Std. Rails	Light Rails	Joint Bars	Track Spikes	Screw Spikes	Tie Plates	Track Bolts Untreated
Bessemer *U1*	5.525	6.50	6.975				14.75
Cleveland *R3*				9.75		6.60	
So. Chicago *R3*							
Ensley *T2*	5.525	6.50		9.75		6.60	
Fairfield *T2*		6.50					
Gary *U1*	5.525					6.60	
Huntington *C16*		6.50					
Ind. Harbor *I3*	5.525		6.975	9.75		6.60	
Ind. Harbor *Y1*				9.75			
Johnstown *B3*		6.50					
Joliet *U7*			5.975				
Kansas City *S2*				9.75			14.75
Lackawanna *B3*	5.525	6.50	6.975			6.60	
Lebanon *B3*			6.975		14.50		14.75
Minnequa *C6*	5.525	7.00	6.975	9.75		6.60	14.75
Pittsburgh *P5*							14.75
Pittsburgh *J3*				9.75			
Seattle *B2*				10.25		6.75	15.75
Steelton *B3*	5.525		6.975			6.60	
Struthers *Y1*				9.75			
Torrance *C7*						6.75	
Williamsport *S5*		6.50					
Youngstown *R3*				9.75			

COKE

Furnace, beehive (f.o.b.)	Net-Ton
Connellsville, Pa.	$15.00 to $15.75
Foundry, beehive (f.o.b.)	$17.50 to $19.00
Foundry oven coke	
Buffalo, del'd	$31.75
Detroit, f.o.b.	30.50
New England, del'd	31.55
Kearney, N. J., f.o.b.	29.75
Philadelphia, f.o.b.	29.50
Swedeland, Pa., f.o.b.	29.50
Painesville, Ohio, f.o.b.	30.50
Erie, Pa., f.o.b.	30.50
Cleveland, del'd	32.65
Cincinnati, del'd	31.84
St. Paul, f.o.b.	29.75
St. Louis, f.o.b.	31.50
Birmingham, f.o.b.	28.85
Milwaukee, f.o.b.	30.50
Neville, Is., Pa.	29.25

LAKE SUPERIOR ORES

51.50% Fe natural content, delivered lower Lake ports. Prices for 1957 season. Freight changes for seller's account.

	Gross Ton
Openhearth lump	$12.70
Old range, bessemer	11.85
Old range, nonbessemer	11.70
Mesabi, bessemer	11.60
Mesabi, nonbessemer	11.45
High phosphorus	11.45

ELECTRICAL SHEETS

22-Gage F.o.b. Mill Cents Per Lb	Hot-Rolled (Cut Lengths)*	Cold-Reduced (Coiled or Cut Length) Semi-Processed	Fully Processed
Field		9.625	
Armature	11.10	10.85	11.35
Elect.	11.80	11.55	12.05
Special Motor		12.10	
Motor	12.90	12.65	13.15
Dynamo	13.95	13.70	14.20
Trans. 72	15.00	14.75	15.25
Trans. 65	15.55		
		Grain Oriented	
Trans. 58	16.05	Trans. 66	20.20
Trans. 52	17.10	Trans. 80	19.20
		Trans. 73	19.70

Producing points: Beech Bottom (*W5*); Brackenridge (*A5*); Granite City (*G2*); Indiana Harbor (*I5*); Mansfield (*E2*); Newport, Ky. (*N5*); Niles, O. (*N6*); Vandergrift (*U1*); Warren, O. (*R3*); Zanesville, Butler (*A7*).

ELECTRODES

Cents per lb. f.o.b. plant, threaded, with nipples, unboxed.

GRAPHITE Diam. (In.)	Length (In.)	Price	CARBON* Diam. (In.)	Length (In.)	Price
24	84	26.00	40	100,110	10.70
20	72	25.25	35	110	10.70
18	72	25.75	30	110	10.85
14	72	25.75	24	72 to 84	11.25
12	72	26.25	20	90	11.00
10	60	28.00	17	72	11.40
10	48	28.50	14	72	11.85
7	60	28.25	12	60	12.95
6	60	31.50	10	60	13.00
4	40	35.00	8	60	13.30
3	40	37.00			
2½	30	39.25			
2	24	60.75			

* Prices shown cover carbon nipples.

REFRACTORIES

Fire Clay Brick

Carloads per 1000

First quality, Ill., Ky., Md., Mo., Ohio, Pa. (except Salina, Pa., add $5.00)	$135.00
No. 1 Ohio	120.00
Sec. Quality, Pa., Md., Ky., Mo., Ill.	120.00
No. 2 Ohio	103.00
Ground fire clay, net ton, bulk (except Salina, Pa., add $2.00)	21.50

Silica Brick

Mt. Union, Pa., Ensley, Ala.	$150.00
Childs, Hays, Pa.	155.00
Chicago District	160.00
Western Utah	175.00
California	180.00
Super Duty Hays, Pa., Athens, Tex., Windham, Warren O., Morrisville	157.00-160.00
Silica cement, net ton, bulk, Latrobe	28.50
Silica cement, net ton, bulk, Chicago	25.50
Silica cement, net ton, bulk, Ensley, Ala.	26.50
Silica cement, net ton, bulk, Mt. Union	24.50
Silica cement, net ton, bulk, Utah and Calif.	37.00

Chrome Brick

Per net ton

Standard chemically bonded, Balt.	$105.00
Standard chemically bonded, Curtiner, Calif.	115.00
Burned, Balt.	99.00

Magnesite Brick

Standard Baltimore	$131.00
Chemically bonded, Baltimore	116.00

Grain Magnesite

St. ⅜ to ½-in. grains

Domestic, f.o.b. Baltimore in bulk.	$73.00
Domestic, f.o.b. Chewalah, Wash., Luning, Nev. in bulk	46.00
in sacks	52.00-54.00

Dead Burned Dolomite

Per net ton

F.o.b. bulk, producing points in:	
Pa., W. Va., Ohio	$16.75
Midwest	17.00
Missouri Valley	15.00

(Effective Jan. 13, 1958)

MERCHANT WIRE PRODUCTS

F.o.b. Mill	Standard Q Coated Nails Col	Woven Wire Fence Col	"T" Fence Posts Col	Single Loop Bale Ties Col	Galv. Barbed and Twisted Barbless Wire Col	Merch. Wire Ann'ld ¢/lb.	Merch. Wire Galv. ¢/lb.
Alabama City *R3*	173	187		212	193	8.65	9.20
Aliquippa *J5****	173	190			190	8.65	9.325
Atlanta *A8***	175	192		214	198	8.75	9.425
Bartonville *K2***	175	192	178	214	198	8.75	9.425**
Buffalo *W6*						8.65	8.95*
Chicago *N4*****	173	190	172	212	196	8.65	9.325
Cleveland *A6*							
Cleveland *A5*						8.65	
Crawf'dav. *M4***	175	192		214	198	8.75	9.425
Donora, Pa. *A5*	173	187		212	193	8.65	9.20
Duluth *A5*	173	187		212	193	8.65	9.20
Fairfield, Ala. *T2*	173	187		212	193	8.65	9.20
Galveston *D4*	9.10‡						
Houston *S2*	178	192		217	198	8.90	9.45
Jacksonville *M4*	184-1	197		219	203	9.00	9.675
Johnstown *B3***	173	190	172		196**	8.65	9.325**
Joliet, Ill. *A5*	173	187		212	193	8.65	9.20
Kokomo *C9**	175	189		214	195*	8.75	9.30*
L. Angeles *B2*****						9.60	10.275
Kansas City *S2**	178	192		217	198*	8.90	9.45*
Minnequa *C6*†	178	192	177	217	198†	8.90	9.45†
Monessen *P6*					193	8.65	9.20
Palmer, Mass. *W6*						8.95	9.50*
Pittsburg, Cal. *C7*	192	210			213	9.60	10.15
Rankin, Pa. *A5*	173	187			193	8.65	9.20
So. Chicago *R3*	173	187			193	8.65	9.20
S. San Fran. *C6*†				236		9.60	10.15†
Sparrows Pt. *B3***	175			214	198	8.75	9.425
Sterling, Ill. *N4*****	175	192	172	214	198	8.75	9.425
Struthers, O. *Y1**						8.65	9.30
Worcester *A5*	179					8.95	9.50
Williamsport *S5*							

* Zinc less than .10¢.
** 11-12¢ zinc.
*** .10¢ zinc.
† Plus zinc extras.
‡ Wholesalers only.

C-R SPRING STEEL

Cents Per Lb F.o.b. Mill	CARBON CONTENT 0.26-0.40	0.41-0.60	0.61-0.80	0.81-1.05	1.06-1.35
Baltimore, Md. *T8*	9.50	10.70	12.90	15.90	18.85
Bristol, Conn. *W12*		10.70	12.90	16.10	19.30
Boston *T8*	9.50	10.70	12.90	15.90	18.85
Buffalo, N. Y. *R7*	8.95	10.40	12.60	15.60	18.55
Carnegie, Pa. *S9*	8.95	10.40	12.60	15.60	18.55
Cleveland *A5*	8.95	10.40	12.60	15.60	18.55
Dearborn *S1*	9.05	10.50	12.70		
Detroit *D1*	9.05	10.50	12.70	15.70	
Detroit *D2*	9.05	10.50	12.70		
Dover, O. *C4*	8.95	10.40	12.60	15.60	18.55
Evanston, Ill. *M8*	9.05	10.40	12.60		
Franklin Park, Ill. *T8*	9.05	10.25	12.45	15.45	18.40
Harrison, N. J. *C11*			12.90	16.10	19.30
Indianapolis *J3*	9.10	10.55	12.60	15.60	18.55
Los Angeles *C7*	11.15	12.60	14.80	17.80	
New Castle, Pa. *B4*	8.95	10.40	12.60	15.60	
New Haven, Conn. *D1*	9.40	10.70	12.90	15.90	
Pawtucket, R. I. *N7*	9.50	10.70	12.90	15.90	18.85
Pittsburgh *S7*	8.95	10.40	12.60	15.60	18.55
Riverdale, Ill. *A1*	9.05	10.40	12.60	15.60	18.55
Sharon, Pa. *S1*	8.95	10.40	12.60	15.60	18.55
Trenton, *R4*		10.70	12.90	16.10	19.30
Wallingford *W1*	9.40	10.70	12.90	15.90	18.55
Warren, Ohio *T4*	8.95	10.40	12.60	15.60	18.75
Worcester, Mass. *A5*	9.50	10.70	12.90	15.90	18.85
Youngstown *J3*	8.95	10.40	12.60	15.60	18.55

BOILER TUBES

$ per 100 ft. carload lots, cut 10 to 24 ft. F.o.b. Mill	Size OD-In.	B.W. Ga.	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.
Babcock & Wilcox	2	13	36.34	42.56	35.22
	2½	12	48.94	57.31	47.43
	3	12	56.51	66.18	54.77
	3½	11	65.97	77.25	63.93
	4	10	87.61	102.59	85.53
National Tube	2	13	36.34	42.56	35.22
	2½	12	48.94	57.31	47.43
	3	12	56.51	66.18	54.77
	3½	11	65.97	77.25	63.93
	4	10	87.61	102.59	85.53
Pittsburgh Steel	2	13	36.34	42.56	
	2½	12	48.94	57.31	
	3	12	56.51	66.18	
	3½	11	65.97	77.25	
	4	10	87.61	102.59	

BOLTS, NUTS, RIVETS, SCREWS

(Base discount, f.o.b. mill)

Machine and Carriage Bolts	Full Container Price	30 Containers	20,000 Lb.	40,000 Lb.
	Pct. Discounts			
½" and smaller x 6" and shorter	49	54	56	57
⅝" thru 1" x longer than 6"	35	40	43	45
Rolled thread carriage bolts ½" & smaller x 6" and shorter	49	54	56	57
Lag, all diam. x 6" & shorter	49	54	56	57
Lag, all diam. longer than 6 in.	39	44½	47	48½
Plow bolts, ½" and smaller x 6" and shorter	49	54	56	57

(Add 25 pct for broken case quantities)

Nuts, Hex, HP reg. & hvy.	Full case or Keg price
¾ in. or smaller	60½
⅞ in. to 1 in. inclusive	55½
1⅛ in. to 1½ in. inclusive	58½
1⅝ in. and larger	53½
C. P. Hex, reg. & hvy.	
¾ in. and smaller	60½
⅞ in. to 1½ in. inclusive	55½
1⅝ in. and larger	53½
Hot Galv. Hex Nuts (All Types)	
¾ in. and smaller	46½
Semi-finished Hex Nuts	
⅝ in. or smaller	60½
¾ in. to 1½ in. inclusive	55½
1⅝ in. and larger	53½
(Add 25 pct for broken case or keg quantities)	
Finished	
⅞ in. and smaller	63
Rivets	
	Base per 100 lb
½ in. and larger	$12.25
	Pct. Off List
7/16 in. and smaller	19

Cap Screws

New std. hex head, packaged	*Discount (Packages) Full Finished H. C. Heat Treat*	
⅝" diam. and smaller x 6" and shorter	40	26
¾", ⅞", and 1" diam. x 6" and shorter	22	3
⅝" diam. and smaller x longer than 6"	8	+13
¾", ⅞", and 1" diam. x longer than 6"	+ 6	+32
	C-1018 Steel Full-Finished Cartons	Bulk
¼" through ⅝" dia. x 6" and shorter	58	49
¾" through 1" dia. x 6" and shorter	45	33

Minimum quantity—¼" through ⅝" diam., 15,000 pieces; 1/16" through ⅝" diam., 5,000 pieces; ¾" through 1" diam., 2,000 pieces.

Machine Screws & Stove Bolts

Plain Finish	Quantity	Discount Mach. Screws	Stove Bolts
Cartons		19	32
Bulk			
To ¼" diam. incl.	25,000-200,000	9	54
5/16 to ½" diam. incl.	25,000-200,000	9	54
All diam. over 3" long	5,000-100,000	—	54

Machine Screws & Stove Bolt Nuts

	Quantity	Discount Hex	Square
In Cartons		16	19
In Bulk			
¾" diam. & smaller	15,000-100,000	7	9

CAST IRON WATER PIPE INDEX

Birmingham	125.8
New York	138.7
Chicago	140.9
San Francisco-L. A.	148.6

Dec. 1955, value, Class B or heavier 5 in. or larger, bell and spigot pipe. Explanation: p. 57, Sept. 1, 1955, issue. Source: U. S. Pipe and Foundry Co.

ELECTROPLATING SUPPLIES

Anodes

(Cents per lb, frt allowed in quantity)

Copper	
Rolled elliptical, 18 in. or longer, 5000 lb lots	42.00
Electrodeposited	33.25
Brass, 80-20, ball anodes, 2000 lb or more	44.00
Zinc, ball anodes, 2000 lb lots (for elliptical add 1¢ per lb)	16.50
Nickel, 99 pct plus, rolled carbon, 5000 lb	1.0225
(Rolled depolarized add 3¢ per lb)	
Cadmium	1.55

Tin, ball anodes $1.13 per lb (approx.).

Chemicals

(Cents per lb, f.o.b. shipping point)

Copper cyanide, 100 lb drum	71.70
Copper sulphate, 100 lb bags, per cwt.	24.35
Nickel salts, single, 100 lb bags	40.50
Nickel chloride, freight allowed, 300 lb	48.50
Sodium cyanide, domestic, f.o.b. N. Y., 200 lb drums	24.05
(Philadelphia price 24.50)	
Zinc cyanide, 100 lb	60.75
Potassium cyanide, 100 lb drum N. Y.	48.00
Chromic acid, flake type, 10,000 lb or more	31.00

METAL POWDERS

Per pound, f.o.b. shipping point, in ton lots for minus 100 mesh

Swedish sponge iron, del. East of Miss. River, ocean bags, 23,000 lb. and over	10.5¢
F.O.B. Riverton or Camden, New Jersey, freight allowed west of Miss. River	9.5¢
Domestic sponge iron, 98+% Fe, 23,000 lb. and over del'd East of Miss. River	10.5¢
F.O.B. Riverton, New Jersey, West of Miss. River	9.5¢
Canadian sponge iron, del'd in East, carloads	10.5¢
Electrolytic iron, annealed, imported 99.5+% Fe	27.5¢
domestic 99.5+% Fe	36.5¢
Electrolytic iron, unannealed minus 325 mesh, 99+% Fe	57.0¢
Electrolytic iron melting stock, 99.84% pure	27.0¢
Carbonyl iron size 3 to 20 micron, 98%, 99.8+% Fe	88.0¢ to $2.85
Aluminum, freight allowed	38.00¢
Brass, 10 ton lots	31.1¢ to 47.1¢
Copper, electrolytic	41.50¢
Copper, reduced	40.3¢ to 48.8¢
Cadmium, 100-199 lb. 95¢ plus metal value	
Chromium, electrolytic, 99.85% min. Fe. 03 max. Del'd	$5.00
Lead	21.50¢ lb, f.o.b. plant
Manganese f.o.b. Extron, Pa.	46.0¢
Molybdenum, 99%	$3.60 to $3.95
Nickel, chemically precipitated	$1.05
Nickel, unannealed	$1.00
Nickel, annealed	$1.06
Nickel, spherical, unannealed #80	$1.13
Silicon	43.50¢
Solder powder	13¢ plus met. value
Stainless steel, 302	$1.02
Stainless steel, 316	$1.30
Tin	14.00¢ plus metal value
Tungsten, 99% (65 mesh)	$3.75 (nominal)
Zinc, 5000 lb & over	17.5¢ to 30.7¢

WAREHOUSES

Metropolitan Price, dollars per 100 lb.

Cities	City Delivery† Charge	Sheets: Hot-Rolled (10 ga. & hvr.)	Sheets: Cold-Rolled (15 gage)	Sheets: Galvanized (10 gage)††	Strip: Hot-Rolled	Plates	Shapes: Standard Structural	Bars: Hot-Rolled (merchant)	Bars: Cold-Finished	Alloy Bars: Hot-Rolled 4615 As rolled	Alloy Bars: Hot-Rolled 4140 Annealed	Alloy Bars: Cold-Drawn 4615 As rolled	Alloy Bars: Cold-Drawn 4140 Annealed
Atlanta		8.59	9.87	10.13	8.64	8.97	9.05	9.01	10.68	.....	.....	.....	.....
Baltimore	$.10	8.38	8.98	9.71	8.86	8.76	9.29	9.16	11.44*	16.18	15.18	19.73	18.98
Birmingham	.15	8.18	9.45	10.15	8.23	8.56	8.64	8.60	10.57	.....	.....	.....	.....
Boston	.10	9.48	10.54	11.55	9.52	9.82	9.73	9.83	13.00	15.79	15.38	19.89	19.18
Buffalo	.15	8.40	9.15	11.22	8.65	9.05	9.05	8.95	11.05*	16.34	15.15	19.01	18.95
Chicago	.15	8.35	9.60	10.15	8.38	8.71	8.79	8.75	8.95	15.80	14.80	19.35	18.60
Cincinnati	.15	8.49	9.65	10.20	8.69	9.08	9.33	9.07	9.46	15.61	15.11	18.96	18.91
Cleveland	.15	8.33	9.60	10.10	8.48	8.94	9.16	8.84	10.95*	15.89	14.89	19.44	18.96
Denver	.20	9.70	11.30	12.49	9.80	9.70	9.80	9.98	10.65	.....	.....	.....	17.60
Detroit	.15	8.58	9.85	10.50	8.73	9.06	9.33	9.05	9.30	15.46	15.06	18.81	18.86
Houston		8.45	9.75	.....	8.60	9.05	8.60	8.55	11.10	16.20	.....	19.30	19.05
Kansas City	.20	9.02	10.27	10.07	9.05	9.38	9.46	9.42	9.87	20.02	15.47	20.02	19.27
Los Angeles	.10	7.85**	10.85	11.75	7.90	7.90	7.95	7.90	13.35*	17.05	16.10	21.05	20.35
Memphis	.15	8.55	9.80	.....	8.60	8.93	9.01	8.97	12.11*	.....	.....	.....	.....
Milwaukee	.15	8.48	9.73	10.28	8.51	8.84	9.00	8.88	9.18	15.43	14.93	18.78	18.73
New York	.10	8.97	10.23	10.66	9.41	9.53	9.45	9.67	12.86*	15.02	15.19	18.42	18.99
Norfolk	.20	8.00	.....	.....	8.40	8.35	8.70	8.45	10.70	.....	.....	.....	.....
Philadelphia	.10	8.10	9.00	9.97	8.79	8.87	8.60	8.75	11.61*	15.61	15.11	18.96	18.91
Pittsburgh	.15	8.33	9.60	10.50	8.48	8.71	8.79	8.75	10.95*	15.80	14.80	19.35	18.60
Portland		8.50	11.20	11.55	9.05	8.30†	8.65	8.65	14.50	18.50	16.10	20.75	20.25
San Francisco	.10	9.45	10.85	11.10	9.55	9.70	9.60	9.80	13.10	17.05	16.10	21.05	20.35
Seattle		9.95	11.15	12.00	10.00	9.70	9.80	10.80	14.05	16.55	16.35	20.65	20.15
Spokane	.15	10.10	11.30	12.15	10.15	9.85	9.95	10.25	14.20	.....	17.35	21.55	21.05
St. Louis	.15	8.69	9.94	10.51	8.74	9.08	9.25	9.12	9.56	15.66	15.16	19.01	18.96
St. Paul	.15	8.94	10.19	10.76	8.99	9.45	9.53	9.37	9.81	.....	15.26	.....	19.06

Base Quantities (Standard unless otherwise keyed): Cold finished bars: 2000 lb or over. Alloy bars: 1000 to 1999 lb. All others: 2000 to 4999 lb. All HR products may be combined for quantity. All galvanized sheets may be combined for quantity. CR sheets may be combined with each other for quantity. ** All sizes except 18 and 16 gage.

†† 10¢ zinc. ‡ Deduct for country delivery. † 3/16 in. to ½ in. * C1018—1 in. rounds.

(Effective Jan. 13, 1958)

(Ferroalloy prices will next appear in the Jan. 23 issue)

PIG IRON

Dollars per gross ton, f.o.b., subject to switching charges.

Producing Point	Basic	Fdry.	Mall.	Bess.	Low Phos.
Birdsboro, Pa. *B6*	68.00	68.50	69.00	69.50	.....
Birmingham *R3*	62.00	62.50*	.....	.....	.....
Birmingham *W9*	62.00	62.50*	66.50	.....	.....
Birmingham *U4*	62.00	62.50*	66.50	.....	.....
Buffalo *R3*	66.00	66.50	67.00	67.50	.....
Buffalo *H1*	66.00	66.50	67.00	67.50	.....
Buffalo *W6*	66.00	66.50	67.00	67.50	.....
Chester *P2*	66.50	67.00	67.50	.....	.....
Chicago *I4*	66.00	66.50	66.50	67 00	.....
Cleveland *A5*	66.00	66.50	66.50	67.00	71.00†
Cleveland *R3*	66.00	66.50	66.50	67.00	.....
Duluth *I4*	66.00	66.50	66.50	67.00	71.00†
Erie *I4*	66.00	66.50	66.50	67.00	71.00†
Everett *M6*	67.50	68.00	68.50	.....	.....
Fontana *K7*	75.00	75.50	.....	.....	.....
Geneva, Utah *C7*	66.00	66.50	.....	.....	.....
Granite City *G2*	67.90	68.40	68.90	.....	.....
Hubbard *Y1*	.....	.....	66.50	.....	.....
Ironton, Utah *C7*	66.00	66.50	.....	.....	.....
Midland *C11*	66.00	.....	.....	.....	.....
Minnequa *C6*	68.00	68.50	69.00	.....	.....
Monessen *P6*	66.00	.....	.....	.....	.....
Neville Is. *P4*	66.00	66.50	66.50	67.00	71.00†
N. Tonawanda *T1*	.....	66 50	67.00	67.50	.....
Sharpsville *S1*	66.00	66.50	66.50	67.00	.....
So. Chicago *R3*	66.00	66.50	66.50	.....	.....
So. Chicago *W8*	66.00	.....	66.50	67.00	.....
Swedeland *A2*	68.00	68.50	69.00	69.50	.....
Toledo *I4*	66.00	66.50	66 50	67.00	.....
Troy, N. Y. *R3*	68.00	68.50	69.00	69.50	74.00
Youngstown *Y1*	.....	.....	66.50	67.00	.....

DIFFERENTIALS: Add, 75¢ per ton for each 0.25 pct silicon or portion thereof over base (1.75 to 2.25 pct except low phos., 1.75 to 2.00 pct) 50¢ per ton for each 0.25 pct manganese or portion thereof over 1 pct, $2 per ton for 0.50 to 0.75 pct nickel, $1 for each additional 0.25 pct nickel. Add $1.00 for 0.31 0.69 pct phos.

Silvery Iron: Buffalo (6 pct), *H1*, $79.25; Jackson *J1*, *I4* (Globe Div.), $78.00; Niagara Falls (15.01 15.50), $101.00; Keokuk (14.01 14.50), $103.50; (15.51 16.00), $106.50. Add $1.00 per ton for each 0.50 pct silicon over base (6.01 to 6.50 pct) up to 18 pct. Add $1.25 for each 0.50 pct manganese over 1.00 pct. Bessemer silvery pig iron (under .10 pct phos.): $64.00. Add $1.00 premium for all grades silvery to 18 pct.

† Intermediate low phos.

STAINLESS STEEL

Base price cents per lb f.o.b. mill

Product	201	202	301	302	303	304	316	321	347	403	410	416	430
Ingots, reroll.	22.00	23.75	23.25	25.25	—	27.00	39.75	32.25	37.00	—	16.75	—	17.00
Slabs, billets	27.00	27.00	28.00	31.50	32.00	33.25	49.50	40.00	46.50	—	21.50	—	21.75
Billets, forging	—	36.50	37.25	38.00	41.00	40.50	62.25	47.00	55.75	32.00	28.25	28.75	28.75
Bars, struct.	42.00	43.00	44.25	45.00	48.00	47.75	73.00	55.50	64.75	37.75	33.75	34.25	34.25
Plates	44.25	45.00	46.25	47.25	50 00	50.75	76.75	59.75	69.75	40.25	35.00	36.75	36.00
Sheets	48.50	49.25	51.25	52.00	—	55.50	81.50	65.50	79.25	48.25	40.25	—	40.75
Strip, hot-rolled	36.00	39.00	37.25	40.50	—	44.25	69.25	53.50	63.50	—	31.00	—	32.00
Strip, cold-rolled	45.00	49.25	47.50	52.00	—	55.50	81.50	65.50	79.25	48.25	40.25	—	40.75
Wire CF; Rod HR	40.00	40.75	42.00	42.75	45.50	45.25	69.25	52.50 52.75	61.50	35.75	32.00	32.50	32.50

STAINLESS STEEL PRODUCING POINTS:

Sheets: Midland, Pa., *C11;* Brackenridge, Pa., *A3;* Butler, Pa., *A7;* Vandergrift, Pa., *U1;* Washington, Pa., *W2, J2,* Baltimore, *E1;* Middletown, O., *A7;* Massillon, O., *R3;* Gary, *U1;* Bridgeville, Pa., *U2;* New Castle, Ind., *I2.*

Strip. Midland, Pa., *C11;* Waukegan, Cleveland, *A5;* Carnegie, Pa., *S9;* McKeesport, Pa., *F1;* Reading, Pa., *C2,* Washington, Pa., *W2;* W. Leechburg, Pa., *A3;* Bridgeville, Pa., *U2;* Detroit, *M2;* Canton-Massillon, O., *R3;* Harrison, N. J., *D3;* Youngstown, *I3,* Sharon, Pa., *S1;* Butler, Pa., *A7;* Wallingford, Conn., *U3* (plus further conversion extras); *W1;* New Bedford, Mass. (.25¢ per lb higher), *R6;* Gary, *U1* (.25¢ per lb higher).

Bar: Baltimore, *A7,* S. Duquesne, Pa., *U1;* Munhall, Pa., *U1,* Reading, Pa., *C2,* Titusville, Pa., *U2,* Washington, Pa., *J2;* McKeesport, Pa., *U1, F1;* Bridgeville, Pa., *U2;* Dunkirk, N. Y., *A3;* Massillon, O., *R5,* S. Chicago, *U1;* Syracuse, N. Y., *C11;* Watervliet, N. Y., *A3;* Waukegan, *A5;* Canton, O., *T5, R3;* Ft. Wayne, *I4;* Detroit, *R5;* Gary, *U1.*

Wire: Waukegan, *A5;* Massillon, O., *R3;* McKeesport, Pa., *F1;* Ft. Wayne, *J4;* Harrison, N. J., *D3;* Baltimore, *A7;* Dunkirk, *A3;* Monessen, *P1;* Syracuse, *C11;* Bridgeville, *U2.*
Structurals: Baltimore, *A7;* Massillon, O., *R3;* Chicago, Ill., *J4;* Watervliet, N. Y., *A3;* Syracuse, *C11;* S. Chicago, *U1.*

Plates: Brackenridge, Pa., *A3;* Chicago, *U1;* Munhall, Pa., *U1;* Midland, Pa., *C11;* New Castle, Ind., *I2;* Middletown; *A7;* Washington, Pa., *J2;* Cleveland, Massillon, *R3;* Coatesville, Pa., *C15;* Vandergrift, Pa., *U1;* Gary, *U1.*

Forging billets: Midland, Pa., *C11;* Baltimore, *A7;* Washington, Pa., *J2;* McKeesport, *F1;* Massillon, Canton, O., *R5;* Watervliet, *A3;* Pittsburgh, Chicago, *U1,* Syracuse, *C11;* Detroit, *R5;* Munhall, Pa., S. Chicago, *U1.*

(Effective Jan. 13, 1958)

Inco high-temperature research note:

Thermal Fatigue

...why it's important to furnace users
...what is being done to overcome it

Thermal fatigue . . . the failure of materials under the repeated stressing induced by thermal cycling . . . is one of the most complex and baffling problems facing furnace users. It shows up as cracking in parent and weld metals of furnace components and fixtures . . . or as excessive deforming (of muffles, for example).

Resistance to thermal fatigue is not directly measurable as a single property of a material. Several factors appear to be involved. Researchers suggest that the following predominate:

1. *A coefficient of expansion that changes as temperatures rise and fall . . .* makes the magnitude of actual stresses induced hard to predict.
2. *A stress-strain relationship that also changes with temperatures . . .* this is a further and equally hard to predict complication with a determining effect on deformation and failure.
3. *High-temperature corrosion resistance* (especially under stress) plus the character of the corrosion product . . . these factors influence the retention of load-carrying cross section and the degree to which notches develop in the material.
4. *The stress relaxation capability of the material . . .* this factor determines whether the material will be notch-weakened or notch-strengthened.

Not all these factors can be measured by present methods. And no one knows, with certainty, the full extent of their influence on the resistance (or lack of resistance) to thermal fatigue of most materials. That is why Inco is intensively researching thermal fatigue problems and their solution.

Inco research tests thermal fatigue on new machine. This new machine heats parts to high temperatures, then cools them to produce repeated thermal shocks. With devices like this, Inco readily obtains comparative data on various heat resistant alloys.

Inco has gathered considerable empirical information. And research has already yielded a working knowledge of how numerous heat resisting alloys behave under conditions that lead to failure from thermal fatigue.

This data may be helpful in leading to a solution of your high-temperature metal problem. Send for our High-Temperature Work Sheet – a simple form for outlining details of your difficulty for our consideration. Use this coupon now.

THE INTERNATIONAL NICKEL COMPANY, INC.
67 Wall Street, New York 5, N. Y.

Please send me the High-Temperature Work Sheet so that I may outline my problem to you.

Name_____

Title_____

Company_____

Address_____

City_____ Zone____ State_____

INCO NICKEL

NICKEL ALLOYS PERFORM BETTER LONGER

Depreciation Change Urged by MDNA

Used machinery dealers again ask Congress to extend benefits of accelerated depreciation to used machinery.

Elmer W. Pfeil, MDNA head, testifies before House Ways and Means Committee.

▪ "Manufacturers who buy used machine tools for their production and machine shop requirements simply cannot understand why our government permits their competitors who buy new machine tools to select the most favorable of five methods of depreciation while they are limited primarily to the straight line method," Elmer W. Pfeil declared in Washington yesterday.

The president of the Machinery Dealers National Assn. was testifying before the House Ways and Means Committee to urge accelerated depreciation for used as well as new machine tools.

Service Listed—Mr. Pfeil pointed out that the present status of Section 167 of the Internal Revenue Code of 1954 had "created a very disturbing, confusing and unfair situation in the metalworking industry."

In expressing the stand of the 225 members of the MDNA and other dealers Mr. Pfeil declared, "The used machine tool industry performs a valuable and required service to the economic productive health of our country by buying surplus machinery from manufacturers, reconditioning or rebuilding it and selling it to other manufacturers. A high percentage of these transactions are with firms in the governments classification of small businessmen."

Why They're Popular—"Some of the reasons why so many used machine tools are purchased by manufacturers in the United States include: Availability. Many concerns buy used tools because they are immediately available, can be purchased and shipped today and used tomorrow on the production line.

Price. Used machinery can be obtained at substantially lower prices than those required for new machines.

Capital investment. Less original capital is required to purchase used machine tools for production purposes.

Beginner's Best Bet—"Tooling-Up. Often in the tooling-up process on a new contract it's advisable to buy a used machine until experience indicates the best machine for a particular job in terms of cost and availability.

Special contracts. Many small manufacturing concerns take a contract for a limited run of items or will take a sub-contract to help another manufacturer complete a specific job. For financial reasons, it is only practical to buy a used machine for this sort of contract.

"New firms. Practically all firms start their business with used machines. As they earn enough profits they sell these machines and buy later model tools. This "up-grading" process goes on continually and the present depreciation schedule places a decided competitive burden on these manufacturers.

"Emergency needs in peacetime or war. During floods, fires or hurricanes an inventory of surplus tools can be drawn upon to quickly re-establish productive capacity."

CONSIDER GOOD USED EQUIPMENT FIRST

BENDING ROLLS
10' x 10" Ga. Bertsch Initial Type
10' x ½" King Pyramid Type
10' x ½" Bertsch Initial Type
18' x 1" Niles Pyramid Type

BRAKE—PRESS TYPE
10' x ⅛" & 12' x ⅛" Hydraulic—NEW

BUILDING
120' x 420' New Steel Frame—Unerected

CRANES—OVERHEAD ELECTRIC TRAVELING

3 ton P&H	56' Span 220/3/60
5 ton Cleveland	60' Span 115 Volt D.C.
5 ton Shepard Niles	70' Span 230 Volt D.C.
8 ton P&H	55' Span 220/3/60
10 ton Shepard Niles	38' Span 440/3/60
10 ton Shaw	48' Span 230 Volt D.C.
10 ton Shaw	120' Span 230 Volt D.C.
15 ton Shepard Niles	52' Span 230 Volt D.C.
15 ton Niles	75' Span 230/3/60
20 ton Shaw	48' Span 230 Volt D.C.
120 ton Shepard Niles	77' Span 220/3/60

DRAW BENCHES
8,000# Waterbury Farrel Single Draw 20 Ft. Length of Draw
10,000# Aetna Standard Single Draw 44 Ft. Length of Draw

FORGING MACHINES
1" to 5" Acme, Ajax, National

FURNACE—MELTING
15 ton Heroult Top Charge, 12' Shell Complete with Transformers

HAMMERS—BOARD DROP—STEAM DROP—STEAM FORGING
800 lb. to 12,000 lb. incl.

HEADERS
#2250 Manville Solid Die Single Stroke
#44 Waterbury Farrel DSOD Capy. ⅝" x 6"

LEVELLERS—ROLLER
37" Torrington, 19 Rolls 1 31/32", dia.
72" Budd-McKay Flex & Roller Leveler 15 Rolls 4¼" Dia.

PLANERS
36" x 36" x 10' Cincinnati
48" x 48" x 16' Niles-Bement-Pond
72" x 72" x 16' Detrick & Harvey Four Head

PRESSES—HYDRAULIC
500 ton HPM Fastraverse, Bed 36" x 36"
600 ton Elmes, 36" Stroke, 48 x 42" Bet. Cols.
1500 ton Bliss 15" Stroke, Bed 49" x 48"
1500 ton Mesta Steam Hydr. Forging Press
4500 Baldwin-Lima-Hamilton Hydr. Forging Press

PRESS—KNUCKLE JOINT
600 ton Bliss No. 25, 2½" Stroke, Bed 24 x 29"

PRESSES—STRAIGHT SIDE
180 ton Hamilton #847, 12" Str. 85½" Bet. Ups.
200 ton Clearing F1200-42, Stroke 36", Bed 44"x38"
250 ton Bliss SI 7½ Str. Bletr. 32" x 39"

PUNCH & SHEAR COMBINATIONS
Cleveland Style EF, Arch Jaw Capy. 1¼" x 1"
Cleveland Style G Single End. 60" Throat
Cleveland Style W, 60" Throat, Architectural Jaw

ROLLING MILLS
6' x 5" Torrington Wire Flattening Mill Line
8" x 10" Schmitz Single Stand Two High
10" x 14" Single Stand Two High
10" x 16" Single Stand Two High
12" x 12" Single Stand Two High
12" x 16" Single Stand Two High
16" x 24" Single Stand Two High
20" x 36" Single Stand Two High

ROLLS—FORMING
18 Stand Custom Built, 2¼" Shaft, will take 36" wide
14 Stand Custom Built, 1⅞" Shaft x 14 3/16"

ROLLS—PLATE STRAIGHTENING
108" Bertsch, Seven Rolls 9" Dia.
72" Niles, 7 Rolls 9" Dia. Motor Driven

SHEAR—ALLIGATOR
No. 4 Mesta RH LK, Capacity 2" x 12"

SHEARS—GATE
12' x ¾" Niagara Model 1212, NEW 1951

SHEAR LINES
36" x .029 Ga. Hallden Shear Line
42" Bliss Up-Cut Shear, Capacity .125" Max. With Hump & Run-out Tables
52" x ⅜" Heavy Duty Shear Line
60 x 7 Ga. Shear Line
96" x 14 Ga. Cleveland Shear Line

SHEARS—SQUARING
10' x ¼" Cincinnati #1810
10' x ⅜" Niagara No. 910

SHEAR—ANGLE
6 x 6 x ⅝" Hilles & Jones

SLITTER
36" Slitting Line Wean

STRAIGHTENERS
No. 3 Medart 3 Roll, Capacity to 4½" Tubing
Torrington 12-Roll Capy. 1¾" Hex., Sq., Etc.
No. OA Medart 2-Roll, Capacity ⅛" to 1" Bars
No. O Medart 2 rolls, Capacity to 1¼" dia. Bars

SWAGING MACHINE
#6½A Fen, Capacity 3⅜" Tube, 1¼" Solid, 16" Die Length Hydraulic Feed, LATE

WELDING POSITIONER
Pandjiris Welding Positioner 22 x 20, Hoist Stroke 20' 10", Boom Stroke 20' 6" LATE

WIRE MACHINERY
Vaughn Wire Drawing Machine, 4 Blocks 22" Dia. Complete elecl. equip. for each block

---

● Manufacturing

A. T. HENRY & COMPANY, INC.

50 CHURCH ST., NEW YORK CITY 8
Telephone COrtlandt 7-3437

Equipment ●

Confidential Certified Appraisals
Liquidations — Bona Fide Auction Sales Arranged

Consulting Engineering Service
Surplus Mfg. Equipment Inventories Purchased

2000# Chambersburg Pneumatic Forging Hammer, Late Type, Serial 20CH392L7.
2500 lb. Model E Chambersburg Steam Drop Hammer, New 1944
6½" Square Alligator Shear; clutch operated; United Engineering & Foundry.
WHEELABRATOR, American; 36" x 42", skip loader hoist; dust arrester.
Lindberg Endothermic Atmospheric Generator; 750 CFH, output 2200 deg. F.
Bliss Trimming Presses Tie Rod Construction Side Shears Capacities 113, 150, 190 tons
3—2-ton Denison Auto. Hopper Feed & Index Table Hydr. Multipress
6' x 10 ga. Cincinnati Squaring Shear
¼" x 8' Pexto Gate Shear; 20" throat
4" National High Duty Upsetting & Forging Machine, air clutch, also one with regular clutch, also 1", 2", 3"
Williams White Bulldozers from 5-ton to 300-ton
Landis Landmaco and other Landis Threading Machines
Single & Double End Punches
No. 3 Motch & Merryweather Saw, with Saw Grinder
No. 3 Waterbury Farrel Progressive Header. Cap. ½"; 4 stations and 1 Cutoff

BOLT, NUT AND RIVET MACHINERY, COLD HEADERS, THREAD ROLLERS, THREADING MACHINES, TAPPERS, COLD BOLT TRIMMERS, SLOTTERS, HOT HEADERS AND TRIMMERS, COLD AND HOT PUNCH NUT MACHINES.

DONAHUE STEEL PRODUCTS CO.

1919 W. 74th Street, Chicago 36, Ill.

REBUILT — GUARANTEED ELECTRICAL EQUIPMENT

MOTOR GENERATOR SETS

Qu.	KW	Make	RPM	D.C. Volts	A.C. Volts
5	1500	Al.Ch.	514	250/700	13800/6900/4160
1	1500	G.E.	514	250	2300/4000
1	1450	Whse.	900	600	2300/4000
2	1250	Al.Ch.	720	600	2300/4000
1	850	G.E.	720	340/350	2300
1	725	Whse.	900	600	2300/4000
1	500	Cr.Wh.	710	600	2300/440
1	500	G.E.	900	250	2300
4	300	Whse.	1200	125/250	2300
1	300 (3-unit)	Al.Ch.	1200	250/500	2300
2	200	Whse.	1200	125/250	2300/440
3	150	Rel.	1200	125	2300/440
1	150	Whse.	1200	125/250	2300/440
1	150	G.E.	1200	250	4160/2300
1	100	Whse.	720	125/250	230
1	75	Whse.	1200	125/250	2300

2—400 KW. G.E. sealed Ignitron Mercury Arc Rectifiers complete with AC and DC switchgear and 475 KVA Pyranol Transf. 2400 V. 3 ph., 60 cycle.

DIRECT CURRENT MOTORS
230-Volt

Qu.	H.P.	Make	Type	R.P.M.
1**	1500	Whse.	Encl.	600
1**	700	Whse.	Encl.	143
1	700	Whse.	Encl.	300/700
2**	600	Whse.	Mill	300/1600
2	600	Whse.	QM	110/220
1	400	G.E.	MPC	450
1	300	Whse.	Mill	300/900
1	300	Whse.	Mill	300
2	275	Whse.	QM	425/850
1	200/250	El.Dy.	Pwd. Brg.	400/1200
1	180	G.E.	MPC	400
1	175	G.E.	CD-175-A	850/1025
1	125	Whse.	SK-184	575-850
1	80	Rel.	681-T	575/1150
1	80	El.Dy.	36-8	525/1050
1	60/75	Whse.	SK-151	250/1000
1	50	Whse.	SK	500/1500
1	50	Whse.	SK-141	250/1000
2	30/40	Whse.	SK-143	500/1500
1	35	Whse.	SK	250/1000
1	32½	Whse.	SK-150	400/1200
1	25	Whse.	SK-121	200/1250
2	15	Whse.	SK-93	575/1725
3	5/7½	Rel.	T.E.F.C.	337/1350

**—600 volts
All others—230 volts

T. B. MAC CABE COMPANY

4302 Clarissa St., Philadelphia 40, Penna.

Cable Address "Macsteel" Philadelphia, Pa. — Phone Davenport 4-8300

GUARANTEED **RE-NU-BILT**

ELECTRIC POWER EQUIPMENT DC MOTORS

Qu.	H.P.	Make	Type	Volts	RPM
1	3900	Elliott		475	320
1	2250	Elliott		900	200/300
1	2200	G.E.	MCF	600	400/500
1	1750	Elliott		250	175/350
1	1375	G.E.	MCF	415	1300
1	1200	G.E.	MCF	600	450/600
1	940	Whse.	QM	250	140/170
3	800	G.E.	MCF	250	400/750
3	450	Whse.		550	415
2	300	G.E.	MPC	230	400
2	200	Whse.	CB-207.4	250	850/1200
2	125	Whse.	SK-190	230	450/1200
1	150	G.E.	CDBB	600	250/700
1	150	Cr. Wh.	65-H	230	1150
1	125	Whse.	SK-185	230	350/1050
1	100	Whse.	SK-181	230	450/1000
1	75	G.E.	CD-1231	230	850
1	50	G.E.	MD-412-AE	230	550
6	40	Rel.BB	385FTEFC	230	500/1500
1	1500	Whse.		525	600
2	750	G.E.	MCF	600	450/900
1	750	G.E.	MCF	600	300/720
1	750	G.E.	MCF	600	120/360

MG SETS—3 Ph. 60 Cy.

Qu.	K.W.	Make	RPM	DC Volts	AC Volts
1	2000	G.E.	514	600	2300/4600
2	1750/2100	G.E.	514	250/300	2500/4600
1	1500	G.E.	600	600	4160/2300
1	1000	G.E.	720	600	6600/13200
1	750	G.E.	720	125/250	2300/4600
1	500	Whse.	900	125/250	440
1	500	G.E.	900	125/250	440/2300
1	350	G.E.	900	125	4160/2300/440
2	300	G.E.	1200	250	2300
1	300	Whse.	1200	575	2300
1	200	Whse.	1200	550	2300
1	200	G.E.	1200	250	440

TRANSFORMERS

Qu.	KVA	Make	Type	Ph.	Voltages
3	3333	Whse.	OISC	1	13800 x 2300
1	1500	G.E. auto	HT	3	4000/4200/4400
3	1000	G.E.	HVDDJ	1	2400 x 480
3	1000	G.E.	OA/FA	1	13800 x 230/460
3	750	G.E.	Pyranol	1	4800 x 83/55
3	500	Kuhl	OISC	1	13200 x 6600
3	500	Moloney	OISC	1	6600/11430Y x 2300/4000Y
1	225 Unused	Marcus	Auto-air	3	208/220
3	150	G.E.		1	33000x2300/4000Y
3	100	Whse.	OISC	1	4600/2300 x 460/230/115
3	100 Unused	G.E.	OISC	1	22900x2400/4160Y

BELYEA COMPANY, INC.

47 Howell Street, Jersey City 6, N. J.

6' x 1" Hilles & Jones Gate Shear, 12" Gap, Motor Driven.
8' x ¼" Niagara Shallow Gap Power Squaring Shear, M.D.

FALK MACHINERY COMPANY

16 Ward St. Baker 5887 Rochester 5, N. Y.

BENNETT MACHINERY CO.

800 TON MILES WHEEL PRESSES

(2) Late Type 800 ton Wheel Presses, 96" between bars; max. dist. ram and resistance head 9'3" wgt. each 65,000 lbs.
(1) 32" Ohio Dreadnaught Shaper, M.D.

375 Allwood Rd., Clifton, New Jersey
Phone: PRescott 9-6996 N. Y. Phone: LOngacre 3-1222

Gemar *Associates*

CONSULTING
MATERIALS HANDLING
ENGINEERS
over 25 years experience
GREENWICH, CONNECTICUT

eastern Rebuilt Machine Tools

THE SIGN OF QUALITY—THE MARK OF DEPENDABILITY

GEAR TESTERS
Type 8M Fellows Red Liner, m.d.
FPV-60 Maag Gear Wheel Co. Profile Testing Instrument
12" National Broach & Machine Co.
18" National Broach & Machine Co.
18" Gleason Bevel Gear Tester, m.d.
No. 471 Michigan Tool Co. Hob, Reamer & Gear Checker
National Broach & Machine Co. "Red Ring" Universal Gear Checker

AUTOMOTIVE GRINDERS
No. 76 Van Norman Automatic Piston Turning & Grinding Machine, m.d.
Kwik-Way Model H Platen Turning & Grinding Machine, m.d.

CENTERLESS GRINDERS
No. 2 Cincinnati, m.d.
No. 3 Cincinnati, m.d.

CARBIDE GRINDERS
No. 48C Excello Carboloy, m.d.
No. 49 Excello H.D. Carbide Grinder, m.d.

CRANKSHAFT GRINDERS
18 x 66" Landis Universal Type C, m.d., late
22 x 72" Landis Type CH, m.d., late

EMERY GRINDERS
48" Double End U. S. Electrical Co. Buffer

CYLINDER GRINDERS
No. 73 Heald Airplane Cylinder Grinder, m.d., new
Model FG Micro Cylinder Grinder, m.d.
No. 50 Heald, m.d., 1944

DISC GRINDERS
No. 4 Gardner Disc Grinder, m.d.
7½ H.P. U. S. Elec. Tool Co., m.d., new
No. 14A Gardner, m.d.
No. 186—36" cap. Gardner, m.d., latest
No. 121 Hanchett Prod. Face Grinder, m.d.

SURFACE GRINDERS
No. 16 Blanchard Rotary, m.d.
No. 16A-2 Blanchard Auto. Rotary, m.d.
No. 33 Abrasive, m.d.
14" Pratt & Whitney Vertical, m.d.
14" Pratt & Whitney Model M 1640 Vertical, m.d.
No. A-1—8" Arter Surface Grinder
No. 22—12" Heald Rotary, m.d.
No. 25-A—24" Heald Rotary, m.d.
No. 25-A—30" Heald Rotary, m.d.
No. 2 Brown & Sharpe, m.d.
#300-60 Hanchett Vertical Spindle, m.d.
10" wide, 24" under wheel, 120" table Mattison, m.d.
Model F, 8 x 10 x 18" Thompson Hydraulic Horizontal Wheel, m.d.

PLAIN CYLINDRICAL GRINDERS
5 x 18" Ott Plain Cylindrical, m.d.
No. 5 Brown & Sharpe Plain Cylindrical, m.d., 1942
No. 10 Brown & Sharpe, m.d.
6 x 15" Cincinnati Plain Hydraulic, m.d.
6 x 18" Cincinnati Model EA, m.d.
6 x 18" Cincinnati Model ER, Plain Hydraulic, m.d., Filmatic Spindle
6 x 18" Landis Type C Hydraulic, m.d., late
6 x 18" Norton Plain Grinder, m.d.
10 x 18" Cincinnati Plain Hydraulic, Model ER, m.d., Filmatic Spindle, 1943

We carry an average stock of 2,000 machines in our 11 acre plant at Cincinnati. Visitors welcome at all times.

THE EASTERN MACHINERY COMPANY
1002 Tennessee Avenue, Cincinnati 29, Ohio
MElrose 1241 "TWX" CI 174 CABLE ADDRESS—EMCO

SQUIRREL CAGE MOTORS

3 phase, 60 cycle, 220 or 440 volts
(*2300 volts or higher)

H.P.	MAKE	TYPE	SPEED
1750	*G.E.	K	3600
1750	*G.E.	K	1800
1250	*Al-Ch.	ANX	3600
600	West	CS	720
600	*G.E.	K-63455	1200
500	*G.E.	K-63455	1200
500	*G.E.	I-13-E	900
350	*G.E.	KT-559-A	1800
300	*G.E.	K-6344	1200
250	*West (TE)	CS-81205	1800
250	*G.E.	KT-599-S	1800
250	*West	CS-875-S	1800
250	Brook	RS-28	1200
200	*G.E.	FT-549	3600
200	*G.E.	I-K-138	1800
200	West	CSP-581-S	1800
200	Brook	RS-27	1200
200	*West	CS-930-A	900
200	G.E.	KT-564-S	720
200	*Al-Ch	AN-37-G	720
200	*West	CS-1010	600
200	Al-Ch	ARW-631	600
150	Cr-Wh	SC-149	3600
150	Al-Ch	AN-30-F	1200
150	West	CSP-5815	1200
150	G.E.	I-K-15A	900
150	*West	CS	600
125	Al-Ch	AR-226	1800
125	Cr-Wh	5-Q	1200
125	G.E.	K-558	900
100	West (TE)	CS-507-S	3600
100	G.E.	FT-542-Z	1800
100	Al-Ch (TE)	ARZ-826	1200
100	Al-Ch	AW-23-D	1200
100	G.E.	KT-556	900
75	Al-Ch	AR-445	3600

M.G. SETS

K.W.	MAKE	A.C.	D.C.
1200	Al-Ch	4160	600
1000	West.	4160	250
500	West.	440	220/110
400	Al-Ch	2300	240/120
300	West.	2300	250
250	G.E.	440	250
200	West.	2300/4000	250
200	G.E.	2300	250/275
200	Rdgwy	2300	250
150	Al-Ch	2300	250/275
150	G.E.	440	257/275
150	West.	2300/440	250/125
125	G.E.	5000	250
125	West.	2300	250
125	C.W.	4160	125
100	G.E.	2300	250
100	G.E.	2300/4000	250/275
100	West.	2300/4000	250/275
100	E.M.	220/440	125
90	G.E.	220/440	125
60	G.E.	220/440	250
50	Reliance	220/440	250

CHICAGO ELECTRIC CO.
1335 W. Cermak Rd., Chicago 8, Ill.

COMPRESSORS

1902-1958
World's Best Rebuilts

138 CFM 100 psi 7 x 7 Ing. ESI
234 CFM 100 psi 9 x 9 Ing. ESI
268 CFM 500 psi 10-4¼ x 10 Ing. XOB
368 CFM 100 psi 12 x 10 IR-CP-Penn
368 CFM 125 psi 10-6 x 7 Joy WN112B
420 CFM 40 psi 12 x 9 Ing. ES-Oil-Less
465 CFM 100 psi 12 x 11 Penn 3AT Gardner X
528 CFM 100 psi 14 x 12 IR-CP-Penn
585 CFM 100 psi 15-9¼ x 12 IR-XRE 3-60-4160
590 CFM 125 psi 13½ x 8 x 8 Penn DE2
669 CFM 50 psi 15 x 11 Worth, HB or HB
676 CFM 100 psi 15-9¼ x 12 Ing. XRB
686 CFM 100 psi 14 x 13 Worth HB
827 CFM 100 psi 17-10½ x 14 Ing. XRB
1007 CFM 110 psi 19-11 x 12 Chic OCB
2018 CFM Vacuum 26 x 11 Penn 7 AT
7900 CFM 200 psi 33-17¾ x 27 Ing. PRE2 1750 Hp 3-60-2300 3 available
5748 CFM 50 psi 29-29 x 21 Ing. PRE1 3-60-2300
PORTABLES—60-600 CFM Rotary or reciprocating

AMERICAN AIR COMPRESSOR CORP.
DELL & 48TH STREET
NORTH BERGEN, N. J.
Telephone UNion 5-4848

#300 Hanchett Vertical Surface Grinder Serial #300-17 capacity 13" x 72".

Cleveland Punch and Shear Model ER-34" throat.

No. 47 Heald Single End Borematic Serial #4646.

Late Type 4" Bar Sellers Heavy Duty Table Type Horizontal Boring Mill Serial No. 1318.

25" x 96" Landis "C," 1943 Cylindrical Grinder Serial #27527.

Hazard Brownell Machine Tools, Inc.
350 Waterman St. Providence 6, R. I.
Dexter 1-8880

POWER EQUIPMENT CO.
Offers
BARGAIN PRICES ON
GUARANTEED
NEW and Rebuilt MOTORS!

JANUARY SPECIALS
REBUILT MOTORS

HP	Make	Type	Speed
200	L.A. TEFCBB	JX-137	1200
150	G.E. TEFCBB	K-6328	3600
100	Al Chal TEFCBB	ARZ-505	1800

Send for our FREE Catalog

Cash for your surplus new & used electric equipment. Send your list today.

Large line of motors, control equipment, AC & DC Generators, MG sets and transformers.

Phone or Wire Us Collect

POWER EQUIPMENT CO.
8 Cairn St., Rochester 2, N. Y.
Phone Genesee 8-5629

18" LANDIS PIPE MACHINE
THREADS AND CUTS PIPE 8" TO 18", NEW 1953, EXCELLENT CONDITION.
4A WARNER & SWASEY TURRET LATHE, 7½" HOLE, BAR & CHUCK, SER. 296,600. EXCEPTIONALLY GOOD CONDITION.
ACE EQUIPMENT CO.
141 N. THIRD ST. PHILA. 6, PA.

FOR SALE
COMPLETE BAR & ROD ROLLING MILL IMMEDIATELY AVAILABLE
Suitable for Rolling Steel or Copper billets down to bar or rod sizes, including hotbed, shears, and rod coiler.
STILL SET-UP, REASONABLY PRICED FOR IMMEDIATE SALE
NATIONAL MACHINERY EXCHANGE
126 Mott St. New York 13, N. Y.
CAnal 6-2470

Buying?
Selling?
The Clearing House serves both buyers and sellers.

SCRAP YARD FOR SALE
Scales, trucks, pick-up, office equipment, gas pump, welder, etc. Fenced and adjoining railroad track. Located in Elko, Nevada. Contact
SHANE IRON & METAL CO.
RENO, NEVADA

MACHINES FOR YOUR YARD
Bay City Model 25 crawler crane
Koehring #304 crane w/45' boom
Pioneer 18" x 74' conveyor
Telsmith 5 x 14 d. d. screen
3 car pullers. Good condition.
Cedar Rapids 16 x 16 roll crusher
TRACTOR & EQUIPMENT CO.
10006 Southwest Highway, Oak Lawn, Ill.

SPECIAL MACHINERY

DIAMITE *Abrasive Resistant* Castings
NI-RESIST *Heat & Corrosion Resistant* Castings
P M G BRONZE *High Strength Acid Resistant* Castings
Fully Equipped—Pattern Foundry & Machine Shop Facilities—Castings to 15 tons.
Weatherly Foundry & Mfg. Co., Weatherly, Pa.

THE FORMULA:

Multi-operation presses
plus
Yankee skilled workmen
over
Eighty years manufacturing know-how equals
Low cost metal stampings
And precision assemblies
To meet your needs

The GREIST MANUFACTURING CO.
646 Blake St., New Haven 15, Conn.

MEEHANITE©
and NI-HARD CASTINGS
PATTERNS
MACHINE and PLATE SHOP WORK
CUSTOM-BUILT MACHINERY

HARDINGE MANUFACTURING CO.
240 ARCH ST., YORK, PA.

PRESS FORGINGS

MERRILL BROS.
5626 ARNOLD AVENUE
MASPETH, QUEENSBORO, N. Y.

Let us quote on
STAMPINGS and ASSEMBLIES
from drawing or sample

Drilling . . . Blanking . . . Riveting . . . Forming . . . Tapping . . . Welding . . . Toolmaking of course

COMPLETE DESIGN AND DEVELOPMENT FACILITIES

HUEBEL MFG. CO., INC.
763 Lexington Ave. Kenilworth, N. J.

DROP FORGINGS

Special Forgings of Every Description.
We solicit your prints or model for quotation.

Wilcox Forging Corporation
Mechanicsburg Penna.

DROP FORGINGS

To Your Specifications
Prompt Quotations

BALDT ANCHOR CHAIN & FORGE DIVISION
P. O. Box 350—Chester, Pennsylvania

CONTRACT MANUFACTURING

OLSON
SCREW MACHINE PRODUCTS

Made to your specifications and tolerances. From smallest up to 2⅝" diameter in steel, brass and aluminum.

OLSON MANUFACTURING CO.
101 Prescott St., Worcester, Mass.

K DROP FORGINGS

SINCE 1895

Small drop forgings up to one pound in size. Inquiries invited for very prompt action.

KEYSTONE FORGING COMPANY
Northumberland Pennsylvania GReenwood 3-3525

Nepsco
NEW ENGLAND PRESSED STEEL COMPANY
Contract Manufacturer since 1914
METAL STAMPINGS
SPECIALTIES — APPLIANCES
For Industrial and Domestic Users
P. O. BOX 29
NATICK MASSACHUSETTS

DROP FORGINGS

Special Forgings—High Quality, Fast Delivery. For prompt attention phone or send prints to John Bello.

CARCO INDUSTRIES, INC.
7341 Tulip Street, Phila. 35, Pa.
DEvonshire 2-1200

Special Washers

We carry in stock Silicon killed steel specially suited for case-hardening. Stock dies for producing washers from .0015 to ½" thick.

Thomas Smith Company
294 Grove St., Worcester, Mass.

SEND US YOUR BLUEPRINTS
FOR QUOTATION

GRINDING ..... Centerless & Surface Internal & External.
MILLING ..... Light and Heavy Duty.
LAPPING SERVICE.
TURRET LATHE WORK of every description.
PRODUCTION DRILLING & TAPPING Single & Multiple Holes.
Complete Engineering & Production Service

WICACO SINCE 1868
MACHINE CORPORATION
4840 Stenton Avenue
Wayne Junction, Philadelphia 44, Pa.

STANDARDIZE WITH
STANDARD

MADE TO YOUR SPECIFICATION
STEEL TUBING
CARBON · ALLOY AND STAINLESS
SEAMLESS OR WELDED
PRESSURE AND MECHANICAL
MILL OR WAREHOUSE QUANTITIES
STANDARD TUBE SALES CORP.
76-01 [illegible] BLVD. · BROOKLYN 27, N. Y.

EQUIPMENT AND MATERIALS WANTED

WANTED

One used power squaring shear, gap type; capacity 10 feet by ½-inch mild steel. Also one used set of plate bending rolls, initial or pinch type; capacity 12 ft. by 1-inch mild steel. Frick Company, Waynesboro, Pennsylvania. Phone 1245, extension 47.

WANTED

One—36" to 48" x 216" to 240" ROLL GRINDER — USED. Preferred with crowning attachment

Call or Wire: L. JEFFERS
Aetna-Standard Engineering Co.
Ellwood City, Penna. Phone: Plaza 8-4511

WEISS STEEL CO. INC.
600 WEST JACKSON BLVD.
CHICAGO 6, ILLINOIS
Buyers of Surplus Steel Inventories
38 Years of Steel Service

WANTED
NEW **SURPLUS STEEL** USED
Structurals, Plate, Pipe and Tubing
Consumers Steel & Supply Co.
P. O. Box 270, RACINE, WISCONSIN

WANTED
BRIDGE CRANES
ARNOLD HUGHES COMPANY
2765 PENOBSCOT BLDG. DETROIT, MICH.
WOodward 1-1894

WANTED
SURPLUS STEEL
WALLACK BROTHERS
7400 S. Damen Ave. Chicago 36, Illinois

WHEN IN THE MARKET FOR PRODUCTS

THE WANTED SECTION

MAY SOLVE YOUR NEEDS

EMPLOYMENT EXCHANGE

HELP WANTED

WANTED
Chief Metallurgist

Excellent opening for experienced metallurgical engineer in a fully integrated steel mill. Must have ability to head large department handling such diverse responsibilities as physical and chemical testing, customer service, inspection, and quality control.

Top salary for right man.

Contact Chas. D. Dorworth, Director of Personnel, Alan Wood Steel Co., Conshohocken, Pa.

METALLURGIST

Responsible position as leader of research group for the study and development of high strength materials for rocket hardware. Location, Western Pennsylvania research institution. Detail education and experience in first letter.

ADDRESS BOX G-666
Care *The Iron Age*, Chestnut & 56th Sts., Phila. 39

WELDING ENGINEER

Position involves fundamental studies of welding processes for high strength steels. Applicant should have appropriate engineering degree and some experience. Location, Western Pennsylvania research institution. Detail education and experience in first letter.

ADDRESS BOX G-667
Care *The Iron Age*, Chestnut & 56th Sts., Phila. 39

METALLURGICAL SALES ENGINEER

For Eastern District Office recently opened in Baltimore, Maryland.

Graduate Metallurgist with experience in the use and application of ferro alloys in the steel industry. Previous sales experience desirable. Correspondence will be treated confidential.

Pittsburgh Metallurgical Company, Inc.
3801 Highland Avenue
Niagara Falls, New York
P. O. Box 348 Attn: Sales Department

ACCOUNTS WANTED

SALESMAN

Thoroughly experienced, aggressive, personable, executive-type salesman. Steel, steel products, building and construction materials, commercial and industrial sales background. Age 41. Located in Cleveland, Ohio. Will travel and relocate.

ADDRESS BOX G-668
Care *The Iron Age*, Chestnut & 56th Sts., Phila. 39

CLEANING ROOM SUPERINTENDENT

MUST HAVE SUPERVISORY EXPERIENCE AND BE COMPLETELY FAMILIAR WITH ALL PHASES OF CLEANING ROOM OPERATIONS FOR A MISCELLANEOUS STEEL JOBBING FOUNDRY PRODUCING CASTINGS UP TO 10,000 POUNDS. EXCELLENT OPPORTUNITY FOR AN AGGRESSIVE QUALIFIED MAN WITH A MODERN AND PROGRESSIVE FOUNDRY LOCATED IN THE MIDDLE WEST PRODUCING 600-700 TONS PER MONTH. ADVISE FULL PARTICULARS INCLUDING SALARY REQUIREMENTS.

ADDRESS BOX G-628
Care *The Iron Age*, Chestnut & 56th Sts., Phila. 39

OPENING FOR ROLLER ON 12 INCH MERCHANT MILL. Address Box G-665, Care *The Iron Age*, Chestnut & 56th Sts., Philadelphia 39.

EMPLOYMENT SERVICE

HIGH GRADE MEN—Salaries $5,000 to $25,000. Since 1915 thousands of Manufacturing Executives, Engineers, Sales Managers, Comptrollers, Accountants, and other men of equal calibre have used successfully our confidential service in presenting their qualifications to employers. We handle all negotiations. Submit record with inquiry. The National Business Bourse, 20 W. Jackson Blvd., Chicago 4.

SITUATION WANTED

SALES EXECUTIVE: For Alloy Plate Fabrication, graduate engineer with a twenty year background in production, engineering and sales management of custom built chemical process equipment primarily in the alloys. Seek new challenge in N. Y., N. J., or Pa. area. Address Box G-657, Care *The Iron Age*, Chestnut & 56th Sts., Philadelphia 39.

ADVERTISERS IN THIS ISSUE

An asterisk beside the name of advertiser indicates that a booklet, or other information, is offered in the advertisement. Write to the manufacturer for your copies today.

ADVERTISERS IN THIS ISSUE

An asterisk beside the name of advertiser indicates that a booklet, or other information, is offered in the advertisement. Write to the manufacturer for your copies today.

CLASSIFIED SECTION

Joe's worrying started with an idea he gave the boss.

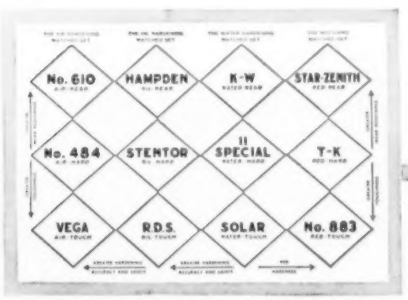
Why produce this radio chassis die in sections? If we can do it in one unit we'll save money.

The boss agreed. But he bet Joe that warping or cracking would wreck his plan . . . and the die!

Using Carpenter VEGA — Joe knew the reputation of this air-hardening tool steel for stability — he went to work. He laid out the holes — 194 of them — on the punch pad and made the punch pads and their dies in one operation. Risky, but economical. The slightest size change in heat treatment . . . and you've had it!

Joe sweated all during heat treating. Then came the final check. With VEGA, only .002" had to be removed with a surface grinder to make the die absolutely flat. The punch pads fitted the die perfectly . . . not even a minor adjustment necessary.

Joe's experience with VEGA isn't exceptional. So if you have a job that requires minimum distortion and size change . . . and you want easy heat treating and extra toughness to boot . . . give VEGA (Air-Tough) a try. Your nearby Carpenter SERVICE-CENTER assures fast delivery from complete stocks.



® U. S. Patent Office, The Carpenter Steel Co., Reading, Pa.

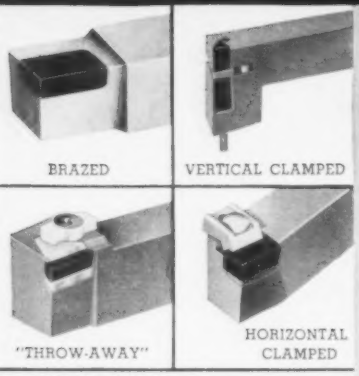
Carpenter STEEL

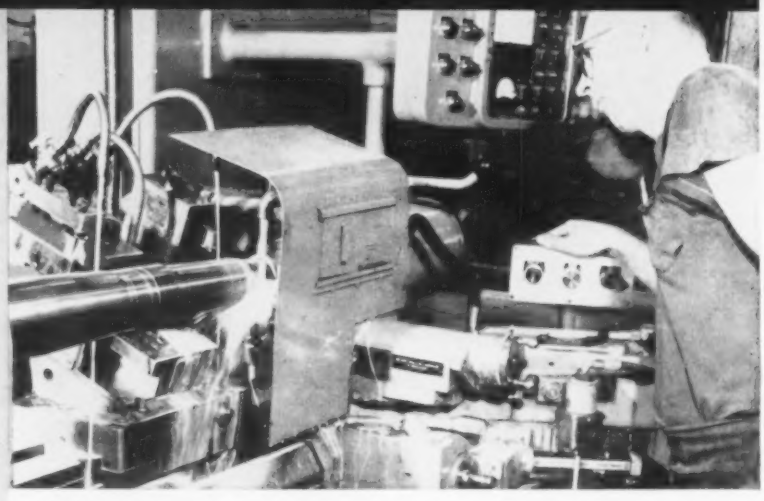
Matched Tool and Die Steels

The Carpenter Steel Co., 121 W. Bern St., Reading, Pa.

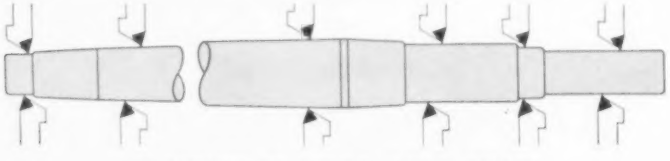
Export Dept.: The Carpenter Steel Co., Port Washington, N. Y.—"CARSTEELCO"

Caterpillar REG. U.S. PAT. OFF. Tractor Co. gets results . . . with Talide S-92





Caterpillar REG. U.S. PAT. OFF. Tractor Co., leading producer of tractors, diesel engines, motor graders and earthmoving equipment, has been using cost-cutting TALIDE tools for over 10 years to produce parts. Typical example of savings obtained is illustrated below:



CRAWLER TRACTOR AXLE SHAFT

Part . . . . . Crawler Tractor Axle Shaft

Material . . . . . SAE 8645 Steel Forging 3¼" dia. x 38½" long. 3.6mm Brinell Hardness.

Operation . . . . Rough turn all diameters, form tapers, shoulders, and steps.

Machine . . . . . Monarch Mona-Matic No. 21 Tracer Lather, size 54".

Tools . . . . . 12 Talide TB-164 ½" I.C. Triangular TALIDE Throw-Away Inserts mounted in Klamp-Lok Toolholders, Grade S-92.

Depth of Cut . . ⅜"

Feed . . . . . 6" per min.—.018 F.P.R.

Speed . . . . . S.F.M. 387—R.P.M. 340

Coolant . . . . . Soluble Oil and Water

Results . . . . . TALIDE Grade S-92 turned 7 shafts per corner per grind for total of 42 shafts per grind. Inserts were ground an average of 6 times and produced a total of 294 shafts over life of insert. Next best premium carbide grade produced 235 shafts.

Call in a Talide sales engineer to recommend proper tooling for your machining operations, or write for 76-page catalog No. 57-G. METAL CARBIDES CORPORATION, 6001 Southern Blvd., Youngstown 12, Ohio.

CONSTANT RESEARCH PAYS OFF!

Year after year Talide metal improves in hardness, strength, rupture resistance and crater resistance properties. Processed in latest type vacuum electric furnaces under rigid laboratory control—all Talide grades are uniform and consistent in quality.

METAL CARBIDES CORPORATION

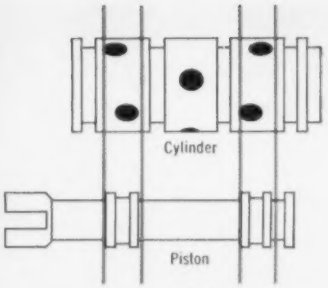
MC

TALIDE®

YOUNGSTOWN 12, OHIO

HOT PRESSED AND SINTERED CARBIDES • VACUUM METALS
HEAVY METAL • ALUMINUM OXIDE • HI-TEMP. ALLOYS
OVER 25 YEARS' EXPERIENCE IN TUNGSTEN CARBIDE METALLURGY

MATCH PISTON LANDS TO CYLINDER PORTS PRECISELY WITH SHEFFIELD'S MICRO-FORM GRINDER



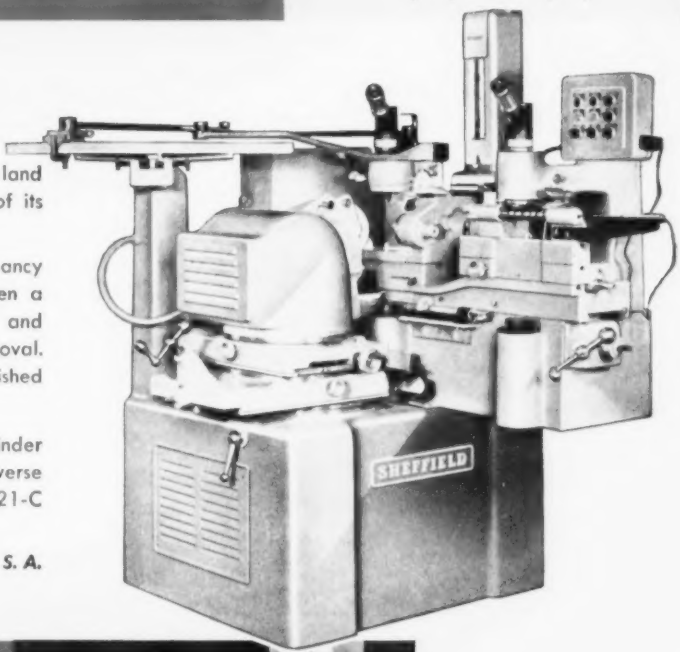
This servo cylinder and piston are typical of the very precisely machined hydraulic components in aircraft propeller and flight control systems.

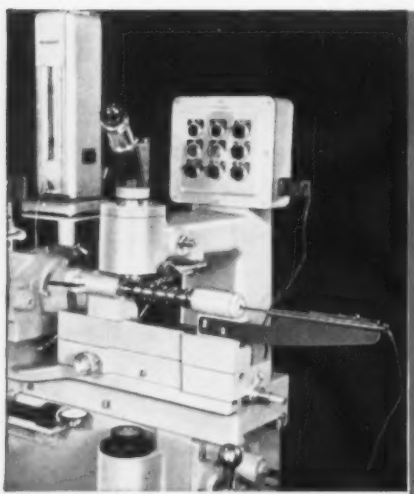
With the actual cylinder as a reference, each piston land is individually ground to match the inside edge of its respective cylinder port.

If a flow test then reveals the slightest discrepancy between land and port edge, the piston is given a finishing touch, using a Sheffield Precisionaire and Airetest Indicator to show progress in stock removal. Thus, the correction of the land face can be accomplished to within ± .000010".

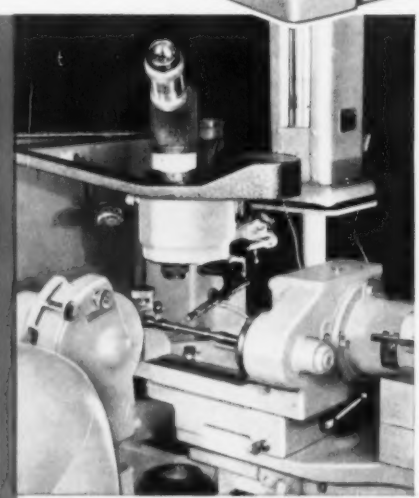
This is typical of the wide range of Micro-Form Grinder applications in duplicating precision profiles or reverse profiles from a master. Write for Bulletin MFG-121-C to Dept. 8.

THE SHEFFIELD CORPORATION, DAYTON 1, OHIO, U. S. A.





Cylinder under observation on auxiliary table.



Airetest Indicator shows stock removal in final correction.

the **SHEFFIELD** *corporation*
of Bendix Aviation
manufacture and measurement for mankind

7560